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ARMSTRONG LABORATORY

STORM WATER MANAGEMENT PLAN
WRIGHT PATTERSON AIR FORCE BASE, OHIO

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This Storm Water Management Plan has been prepared as part of the United States Air Force group permit application. This Plan includes all the components of a storm water pollution prevention plan as outlined in USEPA guidance for general permit holders. Pacific Environmental Services, Inc. (PES) prepared this SWMP for Wright Patterson Air Force Base (WPAFB) through PES' contract with the U.S. Air Force's Armstrong Laboratory.

Section 1 provides an introduction to the SWMP while Section 2 addresses organizational responsibilities; consisting of a description of the storm water management team at WPAFB and implementation procedures to be followed. Section 3 presents the general characteristics of WPAFB, including site history, topography, and general management of the WPAFB SWMP. This section also includes a description of each drainage area and outfall with regard to industrial activities and potential sources of storm water pollution. Section 4 summarizes the Storm Water Cross-Connection Report which was prepared as a separate task under this work assignment. Section 5 describes the management practices for storm water pollution prevention, including process modifications and structural controls. Section 6 describes ongoing compliance and monitoring activities including inspection procedures and monitoring parameters such as analytes, locations, and sampling frequencies.

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NOTICE

Pacific Environmental Services, Inc. (PES) has prepared this report for the U.S. Air Force for the purpose of aiding in the implementation of the Air Force Water Regulations and the Federal Clean Water Act regulations. It is not an endorsement of any product. The views expressed herein are those of the contractor and do not necessarily reflect the official views of the publishing agency, the United States Air Force or the Department of Defense.

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SECTION 1

INTRODUCTION

Storm water discharges have been increasingly identified as a significant source of water pollution in numerous nationwide studies on water quality. To address this problem, the Clean Water Act Amendments of 1987 required the United States Environmental Protection Agency (USEPA) to publish regulations to control storm water discharges under the National Pollution Discharge Elimination System (NPDES). USEPA published storm water regulations on November 16, 1990 which require certain dischargers of storm water to "waters of the United States" to apply for NPDES permits. "Waters of the United States" is generally defined as surface waters, including lakes, rivers, streams, wetlands, and coastal waters. NPDES storm water discharge permits will allow the States and USEPA to track and monitor sources of storm water pollution.

According to the 16 November 1990 final rule, facilities with a "storm water discharge associated with industrial activity" are required to apply for a storm water permit. USEPA has defined this phrase in terms of 11 categories of industrial activity that include: 1) facilities subject to storm water effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards under 40 CFR Subchapter N; 2) "heavy" manufacturing facilities; 3) mining and oil and gas operations with "contaminated" storm water discharges; 4) hazardous waste treatment, storage, or disposal facilities; 5) landfills, land application sites, and open dumps; 6) recycling facilities; 7) steam electric generating facilities; 8) transportation facilities, including airports; 9) sewage treatment plants; 10) construction operations disturbing five or more acres; and 11) other industrial facilities where materials are exposed to storm water. Standard Industrial Classification (SIC) codes are used to identify those manufacturing facilities categorized as "heavy."

The storm water regulations address three permit application options for storm water discharges associated with industrial activity. The first option is to submit an individual application. The second option is to participate in a group application. The third option is to file a Notice of Intent (NOI) to be covered under a general permit in accordance with the requirements of an issued general permit. Regardless of the permit application option a facility selects, the resulting storm water discharge permit will contain a requirement to develop and implement a Storm Water Pollution

Prevention Plan (SWPPP). The United States Air Force (USAF) has decided to submit a group application.

In anticipation of this permit requirement, the USAF has directed all of the Bases involved in their group application submittal to prepare a Storm Water Management Plan (SWMP). These plans will include all the components of a SWPPP as outlined in USEPA guidance for general permit holders. Pacific Environmental Services, Inc. (PES) is preparing this SWMP for Wright-Patterson Air Force Base (WPAFB) through PES' contract with the USAF's Armstrong Laboratory.

Section 2 of the plan addresses organizational responsibilities consisting of a description of the storm water management team at WPAFB and implementation procedures to be followed. Section 3 presents the general characteristics of WPAFB, including site history, topography, and general management of the WPAFB SWMP. This section also includes a description of each drainage area and outfall with regard to industrial activities and potential sources of storm water pollution. Section 4 summarizes the storm water cross-connection report which was prepared as a separate task under this work assignment. Section 5 describes the management practices for storm water pollution prevention, including process modifications and structural controls. Section 6 describes ongoing compliance and monitoring activities including inspection procedures and monitoring parameters such as analytes, locations, and sampling frequencies.

SECTION 2

PLAN ORGANIZATION

PURPOSE

This document is the SWMP for WPAFB, prepared in support of the USAF group application for a NPDES Storm Water Discharge Permit. This SWMP provides guidance for the immediate implementation of a program of storm water quality control and contains all the components of a storm water pollution prevention plan as outlined in current USEPA guidance. Upon final publication by USEPA of guidance specific to the USAF group permit, this plan will be modified to comply with all applicable regulations and would then constitute the SWPPP for WPAFB.

IMPLEMENTATION/MANAGEMENT TEAM

The Office of Environmental Management (EM), 645 ABW/EM, has overall responsibility for environmental compliance at WPAFB, including storm water pollution prevention. The Waste Water Program Manager has the primary responsibility for development and implementation of the SWPPP.

The EM Directorate will:

- Obtain and maintain all necessary permits for the discharge of industrial storm water;
- Maintain records pertaining to storm water pollution prevention;
- Coordinate inspection activities to maintain and improve storm water pollution prevention;
- Prepare a SWPPP and update it as required by Federal, State, and local authorities;

- Support training efforts relative to storm water pollution prevention and ensure integration of these concepts into related environmental resource management training; and

- Serve as the authorized representative of the Base Commander in achieving compliance with storm water regulations. The Commander may delegate signature authority for all reports required by the permit to a duly authorized representative if the authorization is made in writing and submitted to the Director of the Ohio EPA.

Implementation of the storm water pollution prevention initiative at WPAFB will utilize a team approach. Designation of such a team will help achieve program goals by identifying existing programs and resources, identifying organizations on-Base which are directly affected by storm water rules, minimize duplication of effort, and facilitate specification of individual responsibilities necessary to accomplishment of program goals. Proposed team members include representatives of:

- Environmental Compliance Assessments and Management Program (ECAMP). Inspection teams under this program employ environmental compliance assessments to ensure overall Base compliance with environmental regulations. Storm water related issues are already being incorporated in the annual inspection agendas.

- Spill Prevention and Response Plan Coordinator. This plan is maintained by the Waste Water Working Group and is the principle Basewide mechanism for training, contingency planning, spill containment, and subsequent verification that spills have not resulted in contamination of storm sewers or other conveyances.

- Pollution Prevention Program Manager. This plan implements the WPAFB initiative to identify and achieve waste reductions and hazardous waste substitutions wherever such opportunities are feasible.

- EM Representative to the Hazardous Material (HAZMAT) Cell Program. The HAZMAT Cell coordinates purchasing and tracking of all hazardous materials used at WPAFB.

- EM Communication Coordinator. This group provides the primary liaison for distributing storm water program information through the Base newspaper, EM newsletter, and direct communications to specific organizations affected by storm water rules.

- Installation Restoration Program (IRP) Representative. This individual would provide primary point of contact for assuring that all sites under IRP authority are in compliance with applicable storm water rules.

- Petroleum, Oil and Lubricants (POL) Representative. A point of contact to insure that all POL activities are conducted in compliance with applicable storm water rules.

- Civil Engineering (CE) Contractor Inspection Representative. A point of contact to insure that all on-Base contractors operate in compliance with storm water program objectives, including permit requirements for construction activities.

Additionally, a number of organizations at WPAFB will be directly responsible for implementing storm water initiatives within their specific roles or program activities. Identifying a point of contact with each organization will facilitate communication, training, and compliance initiatives to achieve compliance with storm water program goals. Specific organizations include:

- CE - responsibility for achieving compliance within CE for road salt storage, equipment maintenance, storage yards, and other responsibilities of the organization.

- CE - airway de-icing responsibilities.

- 645 LOG/LGMT - provision of aircraft de-icing services and coordination with other providers of de-icing operations.

- 4950th Test Wing, 906th FG/MAQ, 907th MS/LGGF, others - a representative from each organization on-Base conducting flightline operations with a potential for contamination of storm water or storm drain systems.

- DRMO - a point of contact within DRMO responsible for achieving compliance with applicable storm water rules.

REPORT DOCUMENTATION

The following documents and data resources were utilized in development of the SWMP for WPAFB.

- Storm Water Management for Industrial Activities (EPA 832/R-92-006; September 1992).

- Guidance Manual for the Preparation of NPDES Permit Applications for Storm Water Discharges Associated with Industrial Activity (EPA 505/8-91-002; August 1991).
- Fact Sheet for NPDES General Permit for Storm Water Discharges Associates with Industrial Activity (Ohio EPA; July 1992).
- Preliminary Environmental Findings for WPAFB (Environmental Compliance Assessment and Management Program; November 1992).
- Final Baseline Pollution Prevention and Analysis Reports for WPAFB (January, July, and August 1993).
- Spill Prevention and Response Plan for WPAFB (645 ABW; May 1993).
- NPDES Permit 0H0010243-WPAFB, Monthly Monitoring Reports, and Noncompliance Notifications.
- Basewide Monitoring Program Work Plan for WPAFB (645 ABW/EMR).
- IRP Site Descriptions for WPAFB (645 ABW/EMR).
- Inventories of Above Ground Storage Tanks, Underground Storage Tanks, Cooling Towers, Oil/Water Separators, and Hazardous Waste Generator Permits (645 ABW/EM).

SECTION 3

GENERAL CHARACTERISTICS OF THE STORM WATER SYSTEM AT WPAFB

OVERVIEW OF WPAFB

Introduction

During World War I, three military installations were established in the Dayton, Ohio, area that ultimately evolved into WPAFB. Pilot training, research and development, flight testing, and depot activities took place on land leased to the government for wartime use. In 1924, Dayton citizens purchased and deeded to the U.S. Government 4,500 acres of land for the creation of Wright Field. In 1931, the portion of Wright Field east of Huffman Dam was redesignated Patterson Field. The two fields remained separate until 1948, when they were merged to form WPAFB.

WPAFB is the USAF's largest Base in terms of work force, and (at over 8000 acres) one of the largest in terms of real estate. It is the home of numerous organizations including: 1) the Air Force Material Command (AFMC) which has worldwide responsibilities for all of the USAF's supply, depot maintenance, and repair functions and, 2) the Aeronautical Systems Division (ASD), the largest product division of the Air Force Systems Command and the largest single organization at the Base, which conducts research and development for all new USAF aircraft and flight systems. The Base also houses Wright Laboratories, the Air Force Museum (USAF MUS), the Air Force Institute of Technology (AFIT), the Foreign Technology Division (FTD), the USAF Medical Center, and the 906th Tactical Fighter Group (906 TFG), to name a few.

The Base host, the 645 Air Base Wing (645 ABW), is responsible for all activities involved in operating the Base: including law enforcement, roads, utilities, supply and transportation, safety, building maintenance, accounting and finance, flying operations, trash collection, and waste disposal. The 645 ABW includes the Office of Environmental Management (645 ABW/EM) with a director reporting to the Air Base Wing/Base Commander. The mission of the 645 ABW/EM is to educate, motivate, and regulate the Wright-Patterson community in matters concerning the protection and enhancement of the environment.

Environmental Management Structure

The 645 ABW/EM falls directly under the Base Commander at the division level, with a directorate and deputy directorate. The EM office is divided into five branches: Planning (EMX), Resource Protection (EME), Installation Restoration Program (EMR), Environmental Compliance (EMC), and Radiation Safety (EMB).

The Planning Branch (EMX) manages the ECAMP program, provides financial tracking support (A-106, contracting, and budgets), and provides record review for environmental projects through the Base civil engineer. EMX also manages the pollution prevention program which is responsible for eliminating pollution by design, process changes, and chemical substitution.

The Resource Protection Branch (EME) provides oversight for seven EM programs: drinking water, wastewater/storm water, air emissions, natural resources, cultural resources/historic preservation, environmental impact analysis process, and underground storage tank management. Additionally, EME ensures compliance with regulations protecting historic facilities, archaeological resources, endangered species, and wetlands. The branch also manages the environmental impact analysis process to ensure proposed actions are reviewed in keeping with the National Environmental Policy Act (NEPA).

The Installation Restoration Program Branch (EMR) implements and manages all aspects of the IRP. It assesses environmental requirements and develops programs, projects, and studies to satisfy these requirements. EMR serves as the single contract manager through the remedial investigation and feasibility study phases of the IRP. It manages and conducts reviews of technical reports and proposals prepared by IRP contractors.

The Environmental Compliance Branch (EMC) ensures compliance inspections through random sampling, monitoring, and testing programs. EMC provides baseline data for inventory, reporting of pollutant emissions, and tracking remedial actions. Additionally, it tracks compliance violations and coordinates compliance actions Basewide. EMC helps Base organizations develop corrective action plans, determine resource requirements, and develop operating procedures. It serves as the point of contact with other government agencies on compliance issues and coordinates regulatory agency inspections and visits to the Base. EMC manages the Basewide hazardous waste program and helps identify and eliminate hazardous waste through the hazardous waste minimization program. EMC assists in internal ECAMP compliance inspections, writing reports, and tracking the correction of deficiencies. EMC personnel also participate in external ECAMP inspections at other Bases. EMC also manages the PCB and asbestos programs.

The Radiation Safety Branch (EMB) performs hazard evaluations of radiation sources. It monitors and records ionizing radiation exposure and performs radiation safety office duties. EMB processes the radiation material licenses and permits and performs the Base radon program.

Storm Water Collection System

The storm water collection system at WPAFB serves a variety of developed and semi-developed areas on the Base; including aircraft hangars and maintenance facilities, research and test installations, office complexes, warehousing, fuels storage, residential and service facilities, runways, recreational facilities, historic and cultural resources, and undeveloped areas. Twenty drainage areas with defined outfall points have been identified Basewide. These include five drainage areas in Area B (Outfall Areas 1 through 5) and 15 drainage areas in Area A and C (Outfall Area 6 through 20). With the exception of a few IRP sites, all facilities potentially subject to industrial classification under the storm water rules are located within these 20 defined drainage areas.

Areas without defined outfalls include the primarily undeveloped regions along the eastern, northern, and western portions of Area C. Additional undefined areas include most of the Twin Base Golf Course (Area C), the Page Manor residential area, and two small peripheral units in Area B. These areas are designated as Outfall Regions I through VIII.

A capacity expansion of the storm drainage system serving Area B was completed in 1989. The project resulted in the installation of a number of new primary drainage pipelines, and several feeder lines, replaced some existing construction, and reconfigured some of the drainage patterns within Outfall Areas 3 and 4. A similar capacity assessment and system upgrade for portions of Areas A and C are currently in the capacity assessment phase.

Current Regulation of Surface Water Discharges

Storm water discharges from WPAFB are currently monitored and regulated under NPDES Permit No. OH 0010243, which dates from 21 May 1974. Surface water discharges from the Base are monitored at six outfall locations, four of which correspond directly to storm water Outfall Areas 2, 3, 4 and 17. The other NPDES sampling points are located at outfalls to the Mad River in Area C which encompass more than one storm water outfall area.

All of the NPDES outfalls are monitored monthly (if water is flowing during the month) for total suspended solids (TSS), pH, and temperature. In addition, NPDES Outfall 003 (storm water Outfall Area 4) is monitored for oil and grease, chromium, copper, and iron. NPDES Outfall 004 (Hebble Creek, Area C) is monitored for oil and grease and iron. The primary discharge concerns for WPAFB are TSS and iron, with

NPDES Outfall points 002 and 003 being the locations at which exceedances have occurred most frequently. Discharge limits for oil and grease, chromium, and copper have never been exceeded at any of the NPDES sampling points.

Surface waters flowing onto the Base are also monitored for TSS, pH, iron, and temperature at three locations. These sample points provide a basis for comparison of background concentrations for NPDES Outfalls 003 and 004. One of the long-term problems in the sampling program has been the inability to accurately estimate the flow rate at the time of sampling. This problem is being addressed by a project (currently in the design phase) to install flow weirs at the six NPDES outfalls and the three inlet sampling points.

<u>Other Developments Related to Base Storm Water Management</u>

A number of activities currently underway at WPAFB have the potential to effect storm water management issues at the Base. Among these is the 40-year old steam system which is currently undergoing a $9.5 million renovation. The old network of underground piping was identified by representatives of Base Civil Engineering (CE) as a probable former source of non-storm water discharges. The replacement project, scheduled for completion in Fall 1993, should eliminate a significant portion of this source of discharge.

Renovation work on buildings and parking lots Basewide is contributing to improvements in the storm water collection system. Such work incorporates direct improvements to the storm water runoff and collection system, as well as correcting any cross-connections or other structural deficiencies which previously existed within the renovated facilities.

An ongoing project to replace all underground fuel storage tanks on-Base is systematically eliminating these items as a pollution source to soils, groundwater, or surface waters. Approximately $5 million will be expended for removal and replacement of underground tanks during 1993 and 1994.

Several programs are in place which are designed to minimize the potential for any type of spill or loss associated with hazardous material or hazardous wastes used or generated at the Base. These include development of a network of permitted hazardous waste satellite generation and accumulation points, vigorous inspections addressing all aspects of hazardous material/waste management, construction of a new facility specifically designed for centralized shipping and receiving of hazardous materials, and implementation of a hazardous materials "cell" system which will provide for tracking of all hazardous materials used on-Base from point of acquisition to final disposal.

Finally, the Base IRP is currently conducting a boundary characterization of groundwater and surface flows throughout WPAFB. This project (discussed in greater

detail in Section 6) will provide a baseline analysis of the chemical composition of storm waters flowing onto and off of the Base during 1993 and 1994. This information will be useful in establishing a comprehensive storm water monitoring program for WPAFB.

TABLE 3.1

OVERVIEW OF STORM WATER DRAINAGE AREAS[1] AND REGIONS[2] AT WRIGHT-PATTERSON AFB

DRAINAGE AREA/ REGION	CONTAINS INDUSTRIAL ACTIVITY	TOTAL AREA (ACRES)	ESTIMATED IMPERVIOUS SURFACES (%)	OUTFALL LOCATION		RECEIVING[3] SURFACE WATER BODY
				LATITUDE	LONGITUDE	
001	YES	806	18	39°47'01"	84°06'59"	MAD RIVER
002	NO	160	26	39°47'24"	84°06'22"	MAD RIVER
003	YES	417	43	39°47'26"	84°06'14"	MAD RIVER
004	YES	115	49	39°47'38"	84°05'49"	MAD RIVER
005	YES	441	28	39°47'36"	84°04'21"	HEBBLE CREEK
006	NO	140	51	39°47'42"	84°03'15"	HEBBLE CREEK
007	YES	74	65	39°48'00"	84°03'20"	HEBBLE CREEK
008	NO	33	45	39°48'07"	84°03'13"	HEBBLE CREEK
009	NO	170	46	39°48'21"	84°02'44"	HEBBLE CREEK
010	NO	38	22	39°48'31"	84°02'48"	HEBBLE CREEK
011	NO	23	32	39°48'46"	84°02'38"	HEBBLE CREEK
012	YES	353	47	39°48'53"	84°02'32"	HEBBLE CREEK
013	YES	181	69	39°48'54"	84°02'29"	HEBBLE CREEK
014	YES	242	26	39°48'29"	84°03'35"	TROUT CREEK
015	YES	501	15	39°48'39"	84°03'59"	TROUT CREEK
016	YES	60	35	39°49'33"	84°03'28"	MAD RIVER
017	YES	524	38	39°49'41"	84°03'10"	MAD RIVER

DRAINAGE AREA/ REGION	CONTAINS INDUSTRIAL ACTIVITY	TOTAL AREA (ACRES)	ESTIMATED IMPERVIOUS SURFACES (%)	OUTFALL LOCATION		RECEIVING[3] SURFACE WATER BODY
				LATITUDE	LONGITUDE	
018	YES	137	76	39°49'57"	84°02'47"	BASS LAKE
019	YES	47	74	39°50'06"	84°02'52"	BASS LAKE
020	YES	36	63	39°50'26"	84°02'40"	UNNAMED DITCH
I	YES			N/A	N/A	UNNAMED STREAM
II	NO			"	"	UNNAMED STREAM
III	YES			"	"	UNNAMED STREAM
IV	YES			"	"	HEBBLE CREEK
V	YES			"	"	HEBBLE CREEK
VI	YES			"	"	MAD RIVER
VII	YES			"	"	MAD RIVER
VIII	YES			"	"	MAD RIVER

N/A-NOT APPLICABLE

[1]DRAINAGE AREAS, DENOTED WITH A NUMBER, CONVEY SURFACE RUNOFF TO A SINGLE LOCATION WHERE IT DISCHARGES TO A RECEIVING BODY OF WATER.
[2]DRAINAGE REGIONS, DENOTED WITH A ROMAN NUMERAL, CONVEY SURFACE RUNOFF ALONG DIFFUSE OVERLAND PATHS WHERE IT COMBINES WITH A RECEIVING BODY OF WATER.
[3]ALL STORM WATER DISCHARGES FROM WPAFB FLOW VIA TRIBUTARIES TO THE MAD RIVER.

DISCUSSION OF INDIVIDUAL OUTFALLS

The following sections present characteristics of the storm water drainage system for each individual outfall area on the Base. Characteristics include: industrial activities, potential sources of storm water contamination, non-storm discharges, and past spills. Industrial facilities are discussed with respect to existing management practices and controls, remaining problems, and recommendations where appropriate. An overview of the storm water drainage areas and regions at WPAFB is presented in Table 3.1. Maps of storm water drainage areas and photos of the drainage area outfalls are presented as an Appendix following Section 6.

Outfall Area 1

This drainage zone encompasses almost half of the western and southern portion of Area B and includes most of the inactive Wright Field runway. The USAF MUS, museum maintenance hangar, deactivated nuclear reactor, and portions of the avionics laboratory are located in this area.

The primary industrial activity in this area is the Base hazardous waste treatment storage and disposal facility located in Buildings 20478 and 20479. This facility serves as the final collection point for the Basewide system of permitted hazardous waste satellite and accumulation points. The facility operates under an interim status RCRA permit, and is subject to industrial storm water classifications under paragraph iv, for hazardous waste treatment, storage, or disposal facilities.

Building 20479 is a new facility which is equipped with a fire sprinkler system, a secondary containment system below the floor and below the loading dock, and a roof above the loading dock. It is the primary storage facility for drummed and other bulk hazardous wastes. Building 20478, the original hazardous waste storage building, is used for storage in small quantity containers and utilizes portable containment units beneath the stored materials. During 1992, a swale was cut to divert surface runoff water around Building 20478. With completion of these and other recommendations from the 1992 ECAMP inspections, it would appear that operation of the hazardous waste storage facility offers little or no potential for exposure to rainfall or storm water runoff.

There is currently a minor problem with windblown rain getting inside the containment diking at Building 20479. Rainfall is occasionally blown into the area by northwesterly winds. Prevention of this infiltration would require a floor to ceiling enclosure of this area and the feasibility of such construction is currently under review by facility management. The problem does not present a potential contamination of storm water because the infiltrated water is fully contained. Since no spill has ever occurred at Building 20479, this water is considered to be uncontaminated storm water runoff and is pumped back to the storm drainage system. Further discussion of the hazardous waste management program at WPAFB is presented in Section 5 of this report.

Several inactive disposal sites are located within Outfall Area 1 which are subject to Industrial Storm Water Classification, paragraph v; landfills or land application sites that have received any industrial wastes. These include portions of Operable Unit 6 (OU6)-EFDZ1 and LF1; and portions of OU9-EFDs 24, 5, 7, and 9. These sites are under jurisdiction of the WPAFB IRP. The IRP program and individual sites are discussed in detail in Section 5. The sites in Outfall Area 1 include former landfill or earthfill zones which are fully covered and present no current potential for storm water contamination.

Other facilities operating within Outfall Area 1 which present a potential for storm water contamination include Shops A through F of the museum maintenance hangar (SIC Code 8412--Museums), the flight simulator training shop in Building 20156 (SIC Code 8733--Research), the decommissioned nuclear reactor in Building 20470 and the avionics labs in 20620 and 20622 (SIC Code 8733). These facilities are summarized in Table 3.2. None of these facilities appear to meet the criteria for industrial classifications under the storm water regulations.

Although these facilities are exempt from current storm water regulations, the Basewide management of storm water runoff should, at a minimum, monitor the status of discharges from such facilities as well as monitoring any changes in Federal or State rules regarding the classification of such facilities. A more proactive policy for WPAFB would identify and correct all sources of non-storm water discharges regardless of industrial classification and would implement pollution prevention strategies of this plan Basewide. Control measures, facility Best Management Practices (BMPs), and other actions recommended in this plan are presented within the context of this proactive position.

The USEPA's General Permit currently authorizes non-storm water discharges from the following sources:

- Discharges from fire fighting activities.
- Fire hydrant flushings.
- Potable water sources including waterline flushings.
- Irrigation drainage.
- Lawn watering.
- Uncontaminated groundwater.
- Foundation or footing drains where flows are not contaminated with process materials.

- Discharges from springs.

- Routine exterior building washdown which does not use detergents or other compounds.

- Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred and where detergents are not used.

- Air conditioning condensate.

The condensate discharges from Building 20004B and sump discharges from 20470 appear to be authorized under these criteria, while discharges of cooling water from 20004A and 20156 appear to be somewhat indeterminant with respect to these descriptions. Cooling tower blowdown, which may contain biocides and rust inhibitors, is definitely not covered by this list of authorized discharges.

The practice of storing waste drums outside is a potential source of storm water contamination which has been dramatically curtailed at WPAFB over the past several years. Citation of such practices by the 1992 ECAMP inspections (as at 20173) has resulted in correction of the problem at most facilities. Ongoing enforcement through annual ECAMP inspections should serve to minimize the potential for exposure from such practices.

All of the hazardous material and fuel spill incidents reported during the past three years in Outfall Area 1 occurred at Building 20478, the hazardous waste storage facility. These incidents are presented in Table 3.3. All of the spills were small (one gallon or less) and all appear to have been competently contained and recovered, resulting in no potential exposure to storm water. The USEPA General Permit requires a list (in the Storm Water Management Plan) of <u>significant spills or leaks</u> of toxic or hazardous pollutants that occurred at areas that are <u>exposed to precipitation or that otherwise drain to a storm water conveyance</u>. Insofar as the spills at 20478 occurred within an environment protected from such exposure, they are exempt from such listing.

The USEPA has defined "significant spills" to include releases within a 24-hour period of hazardous substances in excess of reportable quantities under Section 311 of the Clean Water Act and Section 102 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Reportable quantities are set amounts of substances in pounds, gallons, or other units and are listed in 40 CFR Part 117 and 40 CFR Part 302. Only the acetone and acetonitrile spills of January 1993, meet the most stringent interpretation of a reportable quantity presented within these references.

Tables 3.4 through 3.7 present the current status of above ground storage tanks, underground storage tanks (UST), cooling towers, and permitted hazardous waste generators within Outfall Area 1. These tables indicate that almost all storage of liquids

is in above ground tanks. Only three USTs remain on active status. Table 3.6 reporting of cooling tower discharges presents findings from two surveys conducted by Base Environmental Management, one in 1987 and a more recent survey conducted in Spring, 1993.

TABLE 3.2

INVENTORY OF FACILITIES WITH POTENTIAL STORM WATER IMPACTS

Outfall Area 1

BUILDING #	DESCRIPTION/FUNCTION	INDUSTRIAL CLASSIFICATION	WASTEWATER DISCHARGE	OTHER[1] POTENTIAL IMPACTS	NON-STORM DISCHARGE OR CROSS-CONNECTIONS	COMMENTS
20004A 20004F	SUPPORT AF MUSEUM - WEAPONS RESEARCH	8412	NO	NO	YES	COOLING WATER DISCHARGES FROM COMPRESSOR SHOP.
20004B	SUPPORT AF MUSEUM - LASERS/ELECTRONICS	8412	NO	NO	?	POSSIBLE STEAM LINE CONDENSATION TO FLOOR DRAINS.
20004C	SUPPORT AF MUSEUM - ART & DESIGN	8412	YES	NO	YES	DEFINITE CC AND DISCHARGE FROM 4C, 4D OR 4E; SOURCE UNKNOWN.
20004D	SUPPORT AF MUSEUM - RADIATION SAFETY	8412	NO	E	YES	SEE ABOVE.
20004E	SUPPORT AF MUSEUM - COLLECTION MANAGEMENT	8412	NO	C	YES	SEE ABOVE.
20156	FLIGHT SIMULATOR TRAINING AND MAINTENANCE	8733	NO	C	YES	COOLANT WATER FROM HYDRAULIC COMPRESSOR.
20470	DECOMMISSIONED NUCLEAR REACTOR	?	NO	D	YES	BASEMENT SUMPS DRAIN WATER COOLED AIR CONDITIONERS
20470	NUCLEAR SPECTROMETRY LAB	8734	YES	NO	NO	LAB SINKS TO SANITARY; OIL/SOLVENT WASTES TO RECYCLE.
20474 20475	BE MAINTENANCE AND STORAGE	EXEMPT	NO	NO	NO	WATER SUPPLY PRESSURIZATION PUMPS IN 475, OTHERWISE STORAGE JANITORIAL SUPPLIES.
20478	HAZARDOUS WASTE - TREATMENT, STORAGE, DISPOSAL	S.W. IV.	NO	A	NO	STORM WATER DIVERSION SWALE INSTALLED, OTHER CORRECTIONS PER ECAMP 1992.
20479	HAZARDOUS WASTE - TREATMENT, STORAGE DISPOSAL	S.W. IV.	NO	NO	NO	POTENTIAL RAINWATER INFILTRATION TO CATCH BASINS.
20620	SC LAB, AVIONICS	8733	?	C,D,E	YES	COOLING TOWER BLOWDOWN TO STORM SEWERS.

TABLE 3.2 (Continued)

BUILDING #	DESCRIPTION/FUNCTION	INDUSTRIAL CLASSIFICATION	WASTEWATER DISCHARGE	OTHER[1] POTENTIAL IMPACTS	NON-STORM DISCHARGE OR CROSS-CONNECTIONS	COMMENTS
20622	SC LAB, AVIONICS	8733	?	C,D	YES	COOLING TOWER BLOWDOWN TO STORM SEWERS.
20739	FIREMAN TRAINING FACILITY	EXEMPT	NO	C	NO	TRAINING USED SMOKE ONLY, HAS BEEN DISCONTINUED. BUILDING SCHEDULED FOR DEMOLITION.

[1]OTHER POTENTIAL IMPACTS AT THIS FACILITY INCLUDE:
A - REPORTED SPILLS
B - OIL/WATER SEPARATORS
C - STORAGE TANKS IN USE
D - COOLING TOWERS IN USE
E - HAZARDOUS WASTES GENERATED

TABLE 3.3

HAZARDOUS MATERIAL AND FUEL SPILL INCIDENTS

Outfall Area 1

BUILDING #	DATE	REMARKS
20478	7/22/91	16 OZ NON-FLAMMABLE CHLORIDE SPILLED.
20478	9/24/92	1 QT TITANIUM TETRACHLORIDE. RECOVERED AND OVERPACKED.
20478	10/16/92	2-3 OZ METHYL ETHYL KETONE. ISOLATED AND OVERPACKED.
20478	1/4/93	1 GAL ACETONE SPILLED.
20478	1/5/93	4 LT JAR OF ACETONITRILE AND METHANOL EXPLODED DUE TO HEAT.

TABLE 3.4

ABOVE GROUND STORAGE TANKS
Outfall Area 1

BUILDING #	BUILDING DESCRIPTION	TANK #	DATE INST.	CAPACITY	TANK CONTENTS
20004E	MUSEUM BLDG	353	-9	250 GAL	WASTE OIL
20156	ACFT RSCH	290	-9	275 GAL	DIESEL
20173		293	-9	450 GAL	
20173		293	-9	450 GAL	
20173		375	-9	55 GAL	WASTE OIL
20618	WTR PMP STN	234	-9	615 GAL	INHIBITOR
20618	WTR PMP STN	336	-9	2300	NONE
20620	SC LAB AVIONICS	202	1987	4500 GAL	LIQUID NITROGEN
20620	SC LAB AVIONICS	405	-9	55 GAL	WASTE OIL
20620	SC LAB AVIONICS	408	-9	55 GAL	WASTE OIL
20620	SC LAB AVIONICS	404	-9	55 GAL	WASTE OIL
20620	SC LAB AVIONICS	409	-9	55 GAL	WASTE OIL
20620	SC LAB AVIONICS	406	-9	55 GAL	WASTE OIL
20620	SC LAB AVIONICS	172	1991	60 GAL	DIESEL
20620	SC LAB AVIONICS	203	1960	2559 GAL	N2
20620	SC LAB AVIONICS	411	-9	55 GAL	WASTE OIL
20620	SC LAB AVIONICS	204	-9	55 GAL	WASTE OIL
20620	SC LAB AVIONICS	201	1960	2559 GAL	LIQUID NITROGEN
20620	SC LAB AVIONICS	407	-9	55 GAL	WASTE OIL
20620	SC LAB AVIONICS	412	-9	55 GAL	WASTE OIL
20620	SC LAB AVIONICS	410	-9	55 GAL	WASTE OIL

TABLE 3.5

UNDERGROUND STORAGE TANKS
Outfall Area 1

BUILDING #	BUILDING DESCRIPTION	TANK #	STATUS	DATE REMOVED	TO BE REMOVED	YEAR INSTALLED	CONTENTS	VOLUME
20470	NUCLEAR ENG TEST BLDG	66	REMOVED	08/92		1959	REMOVED	5000
20470	NUCLEAR ENG TEST BLDG	62	REMOVED	08/92		1959	REMOVED	60000
20470	NUCLEAR ENG TEST BLDG	64	REMOVED	08/92		1959	REMOVED	10000
20470	NUCLEAR ENG TEST BLDG	61	REMOVED	08/92		1959	REMOVED	60000
20470	NUCLEAR ENG TEST BLDG	65	REMOVED	08/92		1959	REMOVED	5000
20470	NUCLEAR ENG TEST BLDG	63	REMOVED	08/92		1959	REMOVED	60000
20470	NUCLEAR ENG TEST BLDG	67	REMOVED	08/92		1959	REMOVED	500
20481	HTG FCLTY BLDG	363	ACTIVE			1988	DIESEL	500
20619		403	ACTIVE			1989	DIESEL	1000
20620	SC LAB AVIONICS	147	ACTIVE			1985	EMPTY	550
20620	SC LAB AVIONICS	27	ACTIVE			1980	DIESEL	500
20621	RSCH EQUIP STOR	113	ACTIVE			1974	FUEL OIL	1500
20622	SC LAB AVIONICS	423	ABANDONED			-9	NOT FOUND	-9
20739	FIREMAN TRNG FCLTY	412	REMOVED	NF		-9	NOT FOUND	1000
20739	FIREMAN TRNG FCLTY	104	REMOVED	04/92		1952	FUEL OIL	1000

TABLE 3.6

COOLING TOWERS

Outfall Area 1

BUILDING #	BUILDING DESCRIPTION	MAX BLOWDOWN (GAL/DAY)	DISCHARGE 1987	DISCHARGE 1993	SERVICE	COMMENTS
20470	NUCLEAR ENG TEST BLDG	2700	SAN		ABW	
20489	MUSEUM BLDG	7020	SAN		ABW	
20618	WTR PMP STN			SAN	ASD	LAB 9
20620	SC LAB AVIONICS	76032	STORM		ASD	LAB 9 / 3 TOWERS
20622	SC LAB AVIONICS	4750	STORM		ASD	LAB 9

TABLE 3.7

HAZARDOUS WASTE GENERATORS

Outfall Area 1

BUILDING #	BUILDING DESCRIPTION	PERMIT #	ORGANIZATION	PHONE	ROOM NO.
20004D	MUSEUM BLDG	BS-017	USAFM/MHR	56930	PAINT BOOTH
20004D	MUSEUM BLDG	BA-018	USAFM/MHR	56930	REAR OF BLDG.
20004D	MUSEUM BLDG	BS-107	USAM/MHR	56930	19D
20004D	MUSEUM BLDG	BS-089	USAFM/MHR	56930	LEFT REAR HANGR
20620	SC LAB AVIONICS	BS-009	WL/ELR	58658	SE CORNER HSTOR

Outfall Area 2

This area consists of a relatively small drainage zone within the central portion of Area B. It includes most of the inactive Wright Field flight ramps and contains relatively little construction. The Acquisition Management Complex, currently under construction in Outfall Area 2, will house administrative offices of the Aeronautical System Division. There are no facilities or sites within Outfall Area 2 which are subject to Industrial Storm Water Classification.

The only potential source of storm water contamination identified within Outfall Area 2 is the cooling tower blowdown at Building 20022. This information is summarized in Tables 3.8 and 3.9.

Outfall Area 2 is currently covered under the Base NPDES permit. The outfall is designated as NPDES point 001. Discharge is monitored monthly (if flow is present) for total suspended solids (TSS), pH, and temperature. Flow is usually not present at the discharge and was reported as dry on all sampling days in the past year. This discharge point has never recorded exceedances of the TSS or pH limits applicable to the site.

TABLE 3.8

INVENTORY OF FACILITIES WITH POTENTIAL STORM WATER IMPACTS

Outfall Area 2

BUILDING #	DESCRIPTION/FUNCTION	INDUSTRIAL CLASSIFICATION	WASTEWATER DISCHARGE	OTHER[1] POTENTIAL IMPACTS	NON-STORM DISCHARGE OR CROSS-CONNECTIONS	COMMENTS
20022	SC AVIONICS - TECHNICAL LIBRARY	8733	NO	D	YES	COOLING TOWER BLOWDOWN TO STORM SEWER. AIR CONDITIONER CONDENSATE TO STORM.

[1]SEE TABLE 3.2 FOR KEY.

TABLE 3.9

COOLING TOWERS

Outfall Area 2

BUILDING #	BUILDING DESCRIPTION	MAX BLOWDOWN (GAL/DAY)	DISCHARGE 1987	DISCHARGE 1993	SERVICE	COMMENTS
20022	SC AVIONICS LAB	4900	STORM	STORM	ASD	LAB 9
20485	ACFT RSCH ENG	2340	SAN		ABW	

Outfall Area 3

Outfall Area 3 encompasses 417 acres in the north central portion of old Wright Field (Area B). It includes a dense concentration of aeronautical research and test facilities operated under the auspices of the Aeronautical Systems Center, Wright Laboratories, 645 Test Wing, Armstrong Laboratory, 4950 Test Wing, and others. These facilities conduct research and development for aircraft components and flight systems and are variously classifiable under SIC Code 873; Research, Development, and Testing Services. There are no active facilities in Outfall Area 3 subject to Industrial Storm Water Classification.

Several inactive disposal sites within Outfall 3 are subject to Industrial Storm Water Classification under paragraph v; landfills or land application sites that have received any industrial wastes. These sites are administered by IRP and also include a number of pre-1988 spill sites which are not subject to Industrial Storm Water Classification. Sites within Outfall 3 include Operable Unit 8 (OU8); spill sites 5, 7, 9, 11, and UST 71A; and OU9; earthfill disposal zones 2, 3, and 8. These sites are discussed in detail in Section 5. All of these sites are currently covered and protected from exposure to storm water infiltration.

Table 3.10 presents an inventory of facilities within Outfall Area 3 which presently or in the recent past may have constituted potential sources of storm water contamination. The concentration of facilities in a relatively small area, the unknown history of many of the older buildings, as well as the great variety of materials used and resultant wastes generated creates numerous opportunities for potential contamination of storm water. Adding further complexity to the situation is the presence of springs and groundwater seepage associated with the base of the Brassfield limestone formation along the western slope of the hill in Outfall Area 3. The foundations of several buildings are cut into this formation and discharges from foundation sumps and other groundwater seepage creates a high "background" flow in some storm water drain lines in this area.

Potential sources of storm water contamination identified in this area include floor drains from Buildings 20005, 20020A, 20031, 20065, 20071, 20071A, 20076, 20079, 20092, and 20352; cooling tower discharges from 20018H, 20020, 20022B, 20071D, 20125, 20145 and 20146; coolant water from other equipment in Buildings 20005, and 20031; and oil/water separator discharges from 20018 (Unit #44), 20070, 20071, and 20092. Finally, materials testing operations at 20094 include outdoor practices which create potential exposure to storm water runoff.

The outdoor practices at facility 20094 consist of survivability testing of aircraft or aircraft components. Jet fuels (JP-4 and/or JP-5) are utilized in the testing and a strong air flow is generated to simulate flight conditions. Test activities generate a mixed waste stream of fuel and water which is contained in a catch basin and conveyed to a fuel water separator which is not referenced on the Base inventory of oil/water separators. This unit

is a three-chambered Velcon model with a capacity of approximately 500 gallons and a throughput of 20 to 30 gpm. Recovered fuel is stored in an above ground reclamation tank with 10,000 gallon capacity. Water from the separator is discharged to sanitary.

Fuels are stored in two above ground tanks of 4,000 gallons each and are conveyed to the test facility through a blending system with a 3,000 gallon capacity. All of the above ground tanks are diked and runoff from the containment areas flows through one of two inground baffle separators (Unit #31 and #32) and discharges to the storm sewer. Floor drains from the Fabrication Shop (20094) also flow to an inground separator (Unit #30) and discharge to the sanitary sewer.

The facility currently has a contract in place to install a 15,000 gallon capacity inground separator. Construction is to begin in January or February of 1994 with completion in approximately 90 days. This separator will not replace any of the existing units. It is to receive only storm water runoff from the general test area and will operate continuously. Discharge from this unit will be to the storm system.

A number of discharges to the storm drainage system were also identified which are probably allowable under the USEPA General Permit. These include infiltration of groundwater, building sump pumps, condensate from cooling equipment, and discharge from oil/water separators which receive only storm water runoff. The oil/water separator at Tank Farm B/F (Unit #SF-8) fits this description, and other units identified above may also satisfy this criteria. Each oil/water separator should be individually evaluated with respect to its input before determining the regulatory status of the discharge from the unit.

It should be noted that review of records and on-site inspection of facilities within this area indicated that substantial progress had occurred and was continuing to occur in the elimination of potential sources of storm water contamination. These improvements were attributable to other environmental compliance programs administered by 645 ABW/EM, a growing awareness of environmental compliance issues within individual shops and labs, and the impacts of ongoing facility renovation in the areas. Significant sources of potential contamination have been eliminated under the IRP; hazardous materials and hazardous waste management programs have contributed to improved safety performance; pollution prevention initiatives have eliminated or reduced quantities of hazardous materials in use; and Base inspection/enforcement initiatives have identified and corrected numerous deficiencies. All of the shops inspected for this project had facility specific spill prevention and control plans in place and exhibited high standards of housekeeping and materials management as well as an awareness of and a commitment to pollution minimization initiatives. Finally, new construction and renovation of existing facilities is contributing to the elimination of most pre-existing structural deficiencies.

The three-year history of hazardous material and fuel spill incidents is presented in Table 3.11. Each of these events represent spills which occurred in areas exposed to

precipitation or that otherwise drain to a storm water conveyance. The definition of what quantity of fuel constitutes a significant spill under USEPA General Permit criteria is undefined at this point and may have to wait on subsequent regulatory guidance. However, if a tentative "reportable quantity" for fuel spills is set at 20 gallons, then the spills at 20018 and 20031 would be considered significant. The source material for these spills, the Base Fire Department spill report log, did not contain detailed information regarding response and clean-up of the spills. However, more detailed spill response records are maintained by 645 ABW/EMX (Planning).

Summary information for oil/water separators, storage tanks, cooling towers, and permitted hazardous waste generators is presented in Tables 3.12 through 3.17. Note that the majority of USTs for this area have been taken out of service and removed during the past three years. At least nine additional underground tanks are scheduled for removal and replacement within the next year as part of a Basewide initiative to upgrade these facilities.

This outfall area is included on the current NPDES permit, where it is designated as NPDES discharge point 002. It is sampled monthly for TSS, pH, and temperature, and frequently exceeds the discharge limit for TSS. The outfall was cited in the 1992 ECAMP Inspection Reports for the presence of an oil sheen, which was attributed to improperly functioning oil/water separators within the drainage area. A work request was submitted in January 1991 to inspect and evaluate oil/water separators Basewide; this project is currently underway and was at the 35% design stage as of February 1994. Information from the completed report should be used to update this plan. An additional project to install a flow weir at the outlet is also currently in the design stage.

TABLE 3.10

INVENTORY OF FACILITIES WITH POTENTIAL STORM WATER IMPACTS

Outfall Area 3

BUILDING #	DESCRIPTION/FUNCTION	INDUSTRIAL CLASSIFICATION	WASTEWATER DISCHARGE	OTHER[1] POTENTIAL IMPACTS	NON-STORM DISCHARGE OR CROSS-CONNECTION	COMMENTS
20005	METALS FABRICATION - PROTOTYPE COMPONENTS	8731	YES	A,C,E	YES	FURNACE COOLANT WATER DISCHARGE TO STORM. FLOOR DRAINS (2 OR 3) TO STORM; ACCESS RESTRICTED, CONDENSATE ONLY, OTHERS SEALED.
20018	PROPULSION RESEARCH - FUELS, ENGINES	8733	YES	A,B,C	NO	MOSTLY ADMIN OFFICES FOR PROPULSION RESEARCH GROUP.
20018D	PROPULSION RESEARCH - FUELS, ENGINES	8733	YES	C	YES	STEAM CONDENSATE LINES DISCHARGE TO GROUND (PAVEMENT).
20018G	PROPULSION RESEARCH - FUELS, ENGINES	8733	YES	C,E	YES	CONDENSATE FROM LARGE HVAC UNIT DISCHARGES TO STORM.
20018H	PROPULSION RESEARCH - FUELS, ENGINES	8733	YES	D	YES	COOLING TOWER BLOWDOWN DISCHARGE TO STORM.
20020	VISUAL INFORMATION - PHOTO PROCESSING	8733	YES	D	YES	COOLING TOWER BLOWDOWN DISCHARGE TO STORM
20020A	PROPULSION - PROPELLER RESEARCH	8734	NO	E	YES	FLOOR DRAINS TO STORM (RESTRICTED, NO DISCHARGE). ALSO, SUMP PUMPS DISCHARGE GROUND WATER TO STORM.
20021	PROPULSION RESEARCH (BUILDING FACILITY)	8734	?	NONE	NO	BUILDING REFURBISHED; FORMER FLOOR DRAINS TO STORM CORRECTED.
20021	PROPULSION RESEARCH (FUEL FARM)	8734	NO	B,C	NO	STORM WATER RUNOFF FROM FUEL FARM CONTAINMENT AREA TO OIL/WATER SEPARATOR TO STORM (ALL NEW).
20022B	SCI LAB AVIONICS	8733	NO	D,E	YES	COOLING TOWER BLOWDOWN DISCHARGE TO STORM.

TABLE 3.10 (Continued)

BUILDING #	DESCRIPTION/FUNCTION	INDUSTRIAL CLASSIFICATION	WASTEWATER DISCHARGE	OTHER[1] POTENTIAL IMPACTS	NON-STORM DISCHARGE OR CROSS-CONNECTION	COMMENTS
20023	SC LAB - AIRCRAFT CAMERA TESTING	8733	NO	C,D	NO	POSSIBLE HYDRAULIC FLUID DUMP TANK, LOCATION AND STATUS UNKNOWN. PHOTOCHEMICAL WASTE, COOLING TOWER, SUMPS DISCHARGE TO SANITARY.
20031	AFCT RSCH - TIRE AND BRAKE TESTING	8734	YES	A,C	YES	FLOOR DRAINS AND GROUND WATER SUMPS TO STORM. DRAINS RECEIVE CONDENSATE, COOLING WATER FROM HYDRAULIC PUMPS. SOME OUTSIDE STORAGE.
20059	PRPLN R-L A/BRETG	8733	?	B,E	NO	OIL/WATER SEPARATOR (#40) HAS BEEN REMOVED.
20065	ACFT RSCH - MACHINING & STRUCTURAL TESTING	8734	NO	C,E	YES	POSSIBLE FLOOR DRAINS TO STORM.
20070	TECH LAB	8733	YES	B,C,D,E	?	OIL/WATER SEPARATOR, PROBABLE DISCHARGE TO SANITARY, NOT CONFIRMED.
20071	SC LAB MATERIALS - X-RAY LABS AND MACHINE SHOP	8733	NO	B,C	YES	PROBABLE FLOOR DRAINS TO STORM. POSSIBLE STORM WATER TO UTILITY TUNNELS.
20071A	SC LAB - LASER LAB, VACUUM PUMPS	8733	NO	B,C,E	YES	FLOOR DRAIN IN C-BAY. POSSIBLE STORM WATER TO EXHAUST TUNNEL.
20071B	SC LAB - PROPULSION, TURBINES	8733	YES	B,C	NO	FLOOR DRAINS, LAB OUTLETS, SINKS TO OIL/WATER SEPARATOR TO SANITARY.
20071D	SC LAB - PROPULSION, PROPELLERS	8734	NO	D	YES	COOLING TOWER BLOWDOWN DISCHARGE TO STORM.
20072	HAZARDOUS STORAGE, BSC (ACCUMULATION POINT FOR 20005)	8731	NO	C,E	NO	WELL DESIGNED; FULLY ENCLOSED, SUB FLOOR CONTAINMENT, GOOD HOUSEKEEPING. ECAMP 1992 CITATION, STORAGE UNKNOWN MATERIALS, CORRECTED.
20076	FIRE STATION #3	9224	NO	NONE	YES	FLOOR DRAINS, CONFLICTING REPORTS. OCCASIONAL VEHICLE WASHING.

TABLE 3.10 (Continued)

BUILDING #	DESCRIPTION/FUNCTION	INDUSTRIAL CLASSIFICATION	WASTEWATER DISCHARGE	OTHER[1] POTENTIAL IMPACTS	NON-STORM DISCHARGE OR CROSS-CONNECTION	COMMENTS
20079	MEDICAL SCIENCE - TOXICOLOGY LAB	8733	YES	C,D,E	YES	BUILDING DRAINS TO DEACTIVATED NEUTRALIZATION TANK TO UNKNOWN.
20092	RSCH EQUIP STOR - PROPULSION LABS	8734	NO	B,C,E	YES	OIL/WATER SEPARATOR (UNIT #592-1) DISCHARGES TO STORM. ALSO SERVES BUILDING 20352.
20094	AF\CFT RSCH - SURVIVABILITY	8734	NO	B,C,E	YES	OUTSIDE OPERATION; POTENTIAL S.W. EXPOSURE.
20125	AFIT - ELECTRONICS LAB	8733	YES	D,E	YES	COOLING TOWER BLOWDOWN DISCHARGE TO STORM.
20145 20146	ACFT DY RSCH - MACHINE SHOP	8734	NO	C,D,E	YES	TWO COOLING TOWERS BLOWDOWN DISCHARGE TO STORM.
20352	RSCH EQUIP STOR - PRPLSN LABS	8734	NO	B	YES	FLOOR DRAINS TO OIL/WATER SEPARATOR (#S92-1) TO STORM
20490	PRPLN R-L FUEL/LUBE	8734	NO	B,C,D,E	NO	UST FARM (18 TANKS, TWO OIL/WATER SEPARATORS) INSTALLED 1980/1981.

[1]SEE TABLE 3.2 FOR KEY.

TABLE 3.11

HAZARDOUS MATERIAL AND FUEL SPILL INCIDENTS

Outfall Area 3

BUILDING #	DATE	REMARKS
20018C	12/18/92	UNDERGROUND LEAK FROM JP-4 TANK; APPROX 1200 GAL
20018C	03/27/92	1500 GAL JP-4 FUEL SPILL.
20031	12/05/91	50-60 GAL OF HYDRAULIC FLUID SPILLED.

TABLE 3.12

OIL/WATER SEPARATORS

Outfall Area 3

BUILDING #	BUILDING DESCRIPTION	UNIT #	SIZE(GALS)	DISCHARGE	REMARKS
20018	PRPLN R-L A/BRETG (ADJACENT TO)	44	6 @ 2400 TOTAL = 14400	STORM	CONTINUOUSLY RUNNING, RECEIVES STORM WATER FROM PARKING AREAS.
20018	PRPLN R-L A/BRETG	13	250	SAN	HAS OIL STORAGE TANK
20018C		14	250	SAN	HAS OIL STORAGE TANK
20021	PRPLN R-L A/BRETG	22	100	STORM	REMOVED AND REPLACED WITH UNIT SF-8.
20059	PRPLN R-L A/BRETG	40	250	STORM	REMOVED WITH NO REPLACEMENT.
20048	BUILDING HAS BEEN REMOVED	42	200	STORM	ASSUME REMOVED WITH BUILDING.
20070	TECH LAB LF ANA	26	40	?	
20071	SC LAB MATERIALS	10B	1100	SAN	HAS OIL STORAGE TANK
20071	SC LAB MATERIALS	41	250	STORM	HAS OIL STORAGE TANK - CURRENT STATUS UNKNOWN
20071	SC LAB MATERIALS	10A	180	SAN	HAS OIL STORAGE TANK
20071A	SC LAB MATERIALS	11	1100	SAN	HAS OIL STORAGE TANK
20092	RSCH EQUIP STOR	39	200	STORM	HAS OIL STORAGE TANK
20094	GUN RANGE/SURVIVABILITY	32	1500	STORM	RECEIVES STORM WATER FROM TANK CONTAINMENT AREA.
20094	GUN RANGE/SURVIVABILITY	31	1500	STORM	RECEIVES STORM WATER FROM TANK CONTAINMENT AREA.
20094	ACFT RSCH TEST/SURVIVABILITY	30	700	SAN	
20187	GUN RANGE/SURVIVABILITY	N/A	500	SAN	VELCON SYSTEM, SEPARATOR IS UNDOCUMENTED
20448	SHP ACFT GEN PURP	20	900	SAN	
29464	EXCH, SVC STN	21	500	SAN	
20490	PRPLN R-L FUEL/LUB	35	60	SAN	HAS OIL STORAGE TANK
20490	PRPLN R-L FUEL/LUB	36	1800	SAN	HAS BENTONITE SEALER & OIL STORAGE TANK

TABLE 3.13

ADDITIONAL OIL/WATER SEPARATORS

Outfall Area 3

BUILDING #	BUILDING DESCRIPTION	UNIT #	SIZE(GALS)	DISCHARGE	REMARKS
20071B	SC LAB MATERIALS	SB-71-B1		SAN	INSTALLED 1991/1992
20071B	H-BAY, NORTH	NONE		STORM	INSTALLED 1991/1992; NOT IN SERVICE
20071B	H-BAY, SOUTH	NONE		STORM	INSTALLED 1991/1992; NOT IN SERVICE
20092	RSCH EQUIPT STRG	S92-1		STORM	INSTALLED 1991/1992
20252	PRPLN R-L A/BRETG	NONE		STORM	INSTALLED 1991/1992
G-FARM	TANK FARM G	S-1		SAN	INSTALLED 1991/1992
D-FARM	TANK FARM D	SD-5		STORM	INSTALLED 1991/1992
B/F-FARM	TANK FARM B/F	SF-8		STORM	INSTALLED 1991/1992

TABLE 3.14

ABOVE GROUND STORAGE TANKS

Outfall Area 3

BUILDING #	BUILDING DESCRIPTION	TANK #	DATE INST.	CAPACITY	TANK CONTENTS
20005	SHP ACFT GEN PURP	311	1991	34900 LBS	LIQUID NITROGEN
20005B					
20018B	PRPLN R-L A/BRETG	215	1952	475 GAL	EMPTY
20018	PRPLN R-L A/BRETG	236	-9	900 GAL	ALCOHOL
20018B	PRPLN R-L A/BRETG	216	-9	275 GAL	WASTE OIL
20018E	PRPLN R-L A/BRETG	468	-9	2500 GAL	LIQUID OXYGEN
20018G	PRPLN R-L A/BRETG	469	-9	17 TON	CARBON DIOXIDE
20018	PRPLN R-L A/BRETG	237	-9	900 GAL	STODDARD SOLVENT
20018	PRPLN R-L A/BRETG	205	1978	990 GAL	PROPANE
20018B	PRPLN R-L A/BRETG	467	-9	1500 GAL	LIQUID NITROGEN
20022B		90	-9	1000 GAL	PROPANE
20023	SC LAB AVIONICS	470	-9	55 GAL	WASTE OIL
20031	ACFT RSCH TEST	459	0	50 GAL	HYDRAULIC OIL
20031	ACFT RSCH TEST	462	0	700 GAL	COMMERCIAL HEAVY OIL
20031	ACFT RSCH TEST	455	0	30 GAL	COMMERCIAL LUBE
20031	ACFT RSCH TEST	327	-9	55 GAL	WASTE OIL
20031	ACFT RSCH TEST	463	0	50 GAL	COMMERCIAL HEAVY OIL
20031	ACFT RSCH TEST	464	0	200 GAL	HYDRAULIC OIL
20031	ACFT RSCH TEST	454	0	50	HYDRAULIC OIL
20031	ACFT RSCH TEST	456	0	700 GAL	HYDRAULIC OIL
20031	ACFT RSCH TEST	461	0	250 GAL	HYDRAULIC OIL

TABLE 3.14 (Continued)

BUILDING #	BUILDING DESCRIPTION	TANK #	DATE INST.	CAPACITY	TANK CONTENTS
20031	ACFT RSCH TEST	458	0	300 GAL	HYDRAULIC OIL
20031	ACFT RSCH TEST	457	0	50 GAL	HYDRAULIC OIL
20031	ACFT RSCH TEST	460	0	150 GAL	HYDRAULIC OIL
20031	ACFT RSCH TEST	465	0	250 GAL	HYDRAULIC OIL
20042	BE STOR CV FCLTY	168	-9	5000 GAL	JP-4
20042	BE STOR CV FCLTY	151	-9	6 TON	CARBON DIOXIDE
20065	ACFT RSCH TEST	280	1965	10000 GAL	LIQUID NITROGEN
20065	ACFT RSCH TEST	282	-9		HELIUM
20065	ACFT RSCH TEST	279	1987	1500 GAL	LIQUID NITROGEN
20065	ACFT RSCH TEST	281	-9	1600 PSI	HELIUM
20068	RSCH EQUIP STOR	273	1992	11000 GAL	LIQUID NITROGEN
20068	RSCH EQUIP STOR	275	-9	275 GAL	DIESEL FUEL
20068	RSCH EQUIP STOR	274	1987	1500 GAL	LIQUID NITROGEN
20071	SC LAB MATERIALS	321	-9	55 GAL	WASTE OIL
20071A	SC LAB MATERIALS	153	1987	5000 GAL	CARBON DIOXIDE
20071B	SC LAB MATERIALS	235	-9	4200 GAL	LIQUID CO2
20071A	SC LAB MATERIALS	156	1987	2500 GAL	LIQUID CARBON DIOXIDE
20071A	SC LAB MATERIALS	154	-9	7500 GAL	NITROGEN
20071A	SC LAB MATERIALS	145	-9	10500 GAL	LIQUID NITROGEN
20071B	SC LAB MATERIALS	155	-9	7500 GAL	HELIUM
20071B	SC LAB MATERIALS	292	-9	1000 GAL	DIESEL
20071B	SC LAB MATERIALS	157	1987	2500 GAL	LIQUID CARBON DIOXIDE
20072	HAZARDOUS STORAGE, BSE	413	-9	850 GAL	WASTE OIL
20072	HAZARDOUS STORAGE, BSE	414	-9	550 GAL	SOLVENT

TABLE 3.14 (Continued)

BUILDING #	BUILDING DESCRIPTION	TANK #	DATE INST.	CAPACITY	TANK CONTENTS
20079B	MEDICAL SCIENCE LAB	277	-9	10000 GAL	EMPTY
20079	MEDICAL SCIENCE LABORATORY	289	1967	1600 PSI	EMPTY
20094	ACFT RSCH TEST	195	1977	4000 GAL	JP4
20094	ACFT RSCH TEST	124	1993	4000 GAL	JP-4
20094	ACFT RSCH TEST	230	1983	1000 GAL	EMPTY
20094	ACFT RSCH TEST	198	1980	1000 GAL	JP4
20094	ACFT RSCH TEST	232	1991	24 TON	CARBON DIOXIDE
20094	ACFT RSCH TEST	196	1977	4000 GAL	JP-4
20094	ACFT RSCH TEST	231	1975	12 TON	
20094	ACFT RSCH TEST	227	-9	55 GAL	WASTE OIL
20094	ACFT RSCH TEST	199	1980	1000 GAL	JP4
20094	ACFT RSCH TEST	194	1977	10000 GAL	SCRAP FUEL
20094	ACFT RSCH TEST	226	-9	55 GAL	WASTE OIL
20094	ACFT RSCH TEST	197	1980	1000 GAL	JP
20094	ACFT RSCH TEST	229	-9	55 GAL	WASTE OIL
20094	ACFT RSCH TEST	228	-9	55 GAL	WASTE OIL
20145	ACFT DY RSH TEST	356	-9	55 GAL	WASTE OIL
20145	ACFT DY RSH TEST	360	-9	55 GAL	WASTE OIL
20145	ACFT DY RSH TEST	359	-9	55 GAL	WASTE OIL
20145	ACFT DY RSH TEST	355	-9	55 GAL	WASTE OIL
20145	ACFT DY RSH TEST	357	-9	55 GAL	WASTE OIL
20145	ACFT DY RSH TEST	358	-9	55 GAL	WASTE OIL
20173		293	-9	450 GAL	
20173		293	-9	450 GAL	

TABLE 3.14 (Continued)

BUILDING #	BUILDING DESCRIPTION	TANK #	DATE INST.	CAPACITY	TANK CONTENTS
20173		375	-9	55 GAL	WASTE OIL
20254	ACFT DY RSH LAB	364	-9	55 GAL	WASTE OIL
20254	ACFT DY RSH LAB	372	-9	55 GAL	EMPTY
20254	ACFT DY RSH LAB	365	-9	55 GAL	WASTE OIL
20254	ACFT DY RSH LAB	367	-9	55 GAL	WASTE OIL
20254	ACFT DY RSH LAB	368	-9	55 GAL	WASTE OIL
20254	ACFT DY RSH LAB	373	-9	55 GAL	EMPTY
20254	ACFT DY RSH LAB	362	-9	55 GAL	WASTE OIL
20254	ACFT DY RSH LAB	363	-9	55 GAL	WASTE OIL
20254	ACFT DY RSH LAB	371	-9	55 GAL	EMPTY
20254	ACFT DY RSH LAB	366	-9	55 GAL	WASTE OIL
20254	ACFT DY RSH LAB	487	1993	3000 GAL	LIQUID NITROGEN
20254	ACFT DY RSH LAB	361	-9	55 GAL	WASTE OIL
20254	ACFT DY RSH LAB	369	-9	55 GAL	WASTE OIL
20254	ACFT DY RSH LAB	370	-9	55 GAL	EMPTY
20449	BLDG WATER SUP	276	1987	1500 GAL	LIQUID HYDROGEN
20490	PRPLN R-L FUEL/LUB	144	-9	16000 GAL	LIQUID NITROGEN
20490	PRPLN R-L FUEL/LUB	354	1982	1000	PROPANE
20490	PRPLN R-L FUEL/LUB	143	-9	500 GAL	LIQUID NITROGEN
20651	SC LAB MATERIALS	238	1975	970 GAL	LEFT OVER SLUDGE FROM SYSTEM
20651	SC LAB MATERIALS	239	1975	970 GAL	NONE
20651	SC LAB MATERIALS	221	1991	5000 GAL	NITROGEN
20651	SC LAB MATERIALS	222	1983	1700 LBS	LIQUID NITROGEN
20651	SC LAB MATERIALS	401	-9	55 GAL	WASTE OIL

TABLE 3.14 (Continued)

BUILDING #	BUILDING DESCRIPTION	TANK #	DATE INST.	CAPACITY	TANK CONTENTS
20652		400	-9	55 GAL	WASTE OIL
20652		240	1985	970 GAL	NONE
20653	SC LAB MATERIALS	402	-9	55 GAL	WASTE OIL
20653	SC LAB MATERIALS	224	1973	1500 GAL	NITROGEN
20654	SC LAB MATERIALS	223	1983	7500 GAL	LIQUID NITROGEN
20654	SC LAB MATERIALS	403	-9	55 GAL	WASTE OIL
20655	SC LAB MATERIALS	225	1985	1500 GAL	NITROGEN
20891	ELEC PWR STN BLDG	164	1981	60 GAL	DIESEL

TABLE 3.15

UNDERGROUND STORAGE TANKS

Outfall Area 3

BUILDING #	BUILDING DESCRIPTION	TANK #	STATUS	DATE REMOVED	TO BE REMOVED	YEAR INSTALLED	CONTENTS	VOLUME	REPLACEMENT
20018	PRPLN R-L A/BRETG	73	REMOVED	01/92		1940	REMOVED	1000	
20018	PRPLN R-L A/BRETG	163	REMOVED	04/91		1950	REMOVED	900	
20018D	PRPLN R-L A/BRETG	45	REMOVED	04/91		1930	REMOVED	25000	
20018F	PRPLN R-L A/BRETG	401	REMOVED	07/91		-9	REMOVED	-9	
20018D	PRPLN R-L A/BRETG	43	REMOVED	04/91		1930	REMOVED	25000	
20018D	PRPLN R-L A/BRETG	42	REMOVED	04/91		1930	REMOVED	25000	
20018D	PRPLN R-L A/BRETG	159	ACTIVE/NIS			1992	WASTE FUEL	6000	
20018	PRPLN R-L A/BRETG	71	REMOVED	09/92		1930	WATER	17000	
20018	PRPLN R-L A/BRETG	72	REMOVED	01/92		1940	REMOVED	1000	
20018	PRPLN R-L A/BRETG	148	ACTIVE/NIS			1992	WASTE FUEL	2500	
20018D	PRPLN R-L A/BRETG	44	REMOVED	04/91		1949	REMOVED	25000	
20018	PRPLN R-L A/BRETG	70	REMOVED	09/92		1949	JP-4	17000	
20018D	PRPLN R-L A/BRETG	88	REMOVED	04/91		1950	REMOVED	10000	
20018D	PRPLN R-L A/BRETG	90	REMOVED	04/91		1950	REMOVED	750	
20018D	PRPLN R-L A/BRETG	157	ACTIVE/NIS			1992	JET FUEL	15000	
20018D	PRPLN R-L A/BRETG	89	REMOVED	04/91		1950	REMOVED	10000	
20018D	PRPLN R-L A/BRETG	41	REMOVED	04/91		1930	REMOVED	750	
20018D	PRPLN R-L A/BRETG	87	REMOVED	04/91		1950	REMOVED	10000	
20018D	PRPLN R-L A/BRETG	156	ACTIVE/NIS			1992	JET FUEL	15000	
20018	PRPLN R-L A/BRETG	69	REMOVED	09/92		1951	WATER	500	

TABLE 3.15 (Continued)

BUILDING #	BUILDING DESCRIPTION	TANK #	STATUS	DATE REMOVED	TO BE REMOVED	YEAR INSTALLED	CONTENTS	VOLUME	REPLACEMENT
20018D	PRPLN R-L A/BRETG	165	REMOVED	NF		1970	REMOVED	900	
20018D	PRPLN R-L A/BRETG	158	ACTIVE/NIS			1992	FUEL	6000	
20021	PRPLN R-L A/BRETG	402	REMOVED	03/92		-9	REMOVED	1500	
20042	BE STOR CV FCLTY	167	ACTIVE/NIS			1967	JP-4	5000	
20042	BE STOR CV FCLTY	166	ACTIVE/NIS			1967	JP-4	5000	
20047	HQ AF	93	REMOVED	02/92		1950	REMOVED	2000	
20059	PRPLN R-L A/BRETG	46	REMOVED	05/91		1957	REMOVED	5000	
20061A	TEST LAB LF ANA	420	REMOVED	07/91		-9	NOT FOUND	-9	
20062	PRPLN R-L A/BRETG	226	REMOVED	06/85		-9		10000	
20062	PRPLN R-L A/BRETG	225	REMOVED	06/85		-9		10000	
20062	PRPLN R-L A/BRETG	228	REMOVED	06/85		-9		10000	
20062	PRPLN R-L A/BRETG	227	REMOVED	06/85		-9		10000	
20062	PRPLN R-L A/BRETG	168	ACTIVE/NIS			1992		500	
20070	TECH LAB LF ANA	384	ACTIVE			1990	WASTE OIL	1000	
20070	TECH LAB LF ANA	22	REMOVED	03/92		1943	NOT FOUND	9400	
20070	TECH LAB LF ANA	23	REMOVED	03/92		1943	PICKLE H_2O	9400	
20071	SC LAB MATERIALS	160	ABANDONED			1957	PICKLE H_2O	25000	
20071	SC LAB MATERIALS	119	ABANDONED			1000	PICKLE H_2O	1000	
20071	SC LAB MATERIALS	164	REMOVED	NF		1949	REMOVED	1000	
20071	SC LAB MATERIALS	161	ABANDONED			1957	PICKLE H_2O	25000	
20071	SC LAB MATERIALS	47	REMOVED	04/91		1957	REMOVED	550	
20071	SC LAB MATERIALS	162	REMOVED	04/91		1946	REMOVED	10000	
20071A	SC LAB MATERIALS	56	REMOVED	1992		1977	REMOVED	1000	
20071B	SC LAB MATERIALS	366	ACTIVE			1989	WASTE OIL/FUEL	6000	

TABLE 3.15 (Continued)

BUILDING #	BUILDING DESCRIPTION	TANK #	STATUS	DATE REMOVED	TO BE REMOVED	YEAR INSTALLED	CONTENTS	VOLUME	REPLACEMENT
20071B	SC LAB MATERIALS	365	ACTIVE			1989	EMPTY	6000	
20071B	SC LAB MATERIALS	117	ACTIVE/NIS			1992	WASTE FUEL	6000	
20071A	SC LAB MATERIALS	55	REMOVED	1992		1977	REMOVED	1000	
20071B	SC LAB MATERIALS	146	REMOVED	1992		1950	REMOVED	2000	
20071B	SC LAB MATERIALS	368	ACTIVE			1989	EMPTY	6000	
20071B	SC LAB MATERIALS	367	ACTIVE			1989	EMPTY	6000	
20071B	SC LAB MATERIALS	145	REMOVED	04/91		1950	REMOVED	2000	
20071A	SC LAB MATERIALS	171	ACTIVE/NIS			1992	WASTE FUELS	1000	
20071A	SC LAB MATERIALS	170	ACTIVE/NIS			1992	WASTE FUEL	1000	
20075		153	REMOVED	03/92		1942	DIESEL	1000	
20075		154	REMOVED	03/92		1942	DIESEL	300	
20079F	MEDICAL SCIENCE LAB	26	ACTIVE		12/94	1957	DIESEL	2000	
20088	COMPRESSED GAS STORAGE	21	REMOVED	04/91		1949	REMOVED	3000	
20088	COMPRESSED GAS STORAGE	193	REMOVED	04/91		1975	REMOVED	1000	
20088A	COMPRESSED GAS STORAGE	11	REMOVED	04/91		1943	REMOVED	25000	
20088A	COMPRESSED GAS STORAGE	179	ACTIVE/NIS			1992	JET FUEL	20000	
20088A	COMPRESSED GAS STORAGE	19	REMOVED	04/91		1949	REMOVED	25000	
20088A	COMPRESSED GAS STORAGE	20	REMOVED	04/91		1949	REMOVED	25000	
20088A	COMPRESSED GAS STORAGE	18	REMOVED	04/91		1949	REMOVED	25000	

TABLE 3.15 (Continued)

BUILDING #	BUILDING DESCRIPTION	TANK #	STATUS	DATE REMOVED	TO BE REMOVED	YEAR INSTALLED	CONTENTS	VOLUME	REPLACEMENT
20088A	COMPRESSED GAS STORAGE	12	REMOVED	04/91		1948	REMOVED	25000	
20088A	COMPRESSED GAS STORAGE	17	REMOVED	04/91		1943	REMOVED	25000	
20088A	COMPRESSED GAS STORAGE	180	ACTIVE/NIS			1992	JET FUEL	20000	
20088A	COMPRESSED GAS STORAGE	182	ACTIVE/NIS			1992	JET FUEL	20000	
20088A	COMPRESSED GAS STORAGE	15	REMOVED	04/91		1943	REMOVED	25000	
20088A	COMPRESSED GAS STORAGE	183	ACTIVE/NIS			1992	JET FUEL	20000	
20088A	COMPRESSED GAS STORAGE	184	ACTIVE/NIS			1992	JET FUEL	20000	
20088A	COMPRESSED GAS STORAGE	185	ACTIVE/NIS			1992	JET FUEL	20000	
20088A	COMPRESSED GAS STORAGE	14	REMOVED	04/91		1943	REMOVED	25000	
20088A	COMPRESSED GAS STORAGE	13	REMOVED	04/91		1943	REMOVED	25000	
20088A	COMPRESSED GAS STORAGE	16	REMOVED	04/91		1949	REMOVED	25000	
20088A	COMPRESSED GAS STORAGE	10	REMOVED	04/91		1943	REMOVED	25000	
20088A	COMPRESSED GAS STORAGE	9	REMOVED	04/91		1943	REMOVED	25000	
20088A	COMPRESSED GAS STORAGE	186	ACTIVE/NIS			1992	SCRAP/WASTE	4000	
20088A	COMPRESSED GAS STORAGE	181	ACTIVE/NIS			1992	JET FUEL	20000	
20089A	VECHILE FL STN	3	ABANDONED			1943	FLYASH/SAND	25000	

TABLE 3.15 (Continued)

BUILDING #	BUILDING DESCRIPTION	TANK #	STATUS	DATE REMOVED	TO BE REMOVED	YEAR INSTALLED	CONTENTS	VOLUME	REPLACEMENT
20089	VECHILE FL STN	81	ACTIVE		12/94	1930	USED OIL	10000	10000 G UST
20089	VECHILE FL STN	6	ABANDONED			1943	FLYASH/SAND	25000	
20089	VECHILE FL STN	5	ABANDONED			1943	FLYASH/SAND	25000	
20089	VECHILE FL STN	8	ABANDONED			1943	FLYASH/SAND	25000	
20089	VECHILE FL STN	1	ABANDONED			1943	FLYASH/SAND	25000	
20089	VECHILE FL STN	7	ABANDONED			1943	FLYASH/SAND	25000	
20089	VECHILE FL STN	94	ABANDONED			1943	FLYASH/SAND	6000	
20089	VECHILE FL STN	4	ABANDONED			1943	FLYASH/SAND	25000	
20089	VECHILE FL STN	80	ACTIVE		12/94	1942	DIESEL	10000	10000 G UST
20089	VECHILE FL STN	2	ABANDONED			1943	FLYASH/SAND	25000	
20089	VECHILE FL STN	79	ACTIVE		12/94	1942	MOGAS UNLEADED	10000	10000 G UST
20089	VECHILE FL STN	82	ACTIVE		12/94	1930	USED FUEL	10000	10000 G UST
20092	RSCH EQUIP STOR	115	REMOVED	05/91		1983	REMOVED	5000	
20092	RSCH EQUIP STOR	151	ACTIVE/NIS			1992	WASTE FUEL	6000	
20092	RSCH EQUIP STOR	60	REMOVED	05/91		1967	REMOVED	5000	
20092	RSCH EQUIP STOR	152	ACTIVE/NIS			1992	WASTE FUEL	6000	
20100	ACFT RSCH TEST	422	ACTIVE			1981	FUEL OIL	2000	
20252	PRPLN R-L A/BRETG	369	ACTIVE			1991	WILL BE SCRAP P	550	
20253	PMP STN, LF	139	REMOVED	09/92		1956	SCRAP JP-4	25000	
20253	PMP STN, LF	127	REMOVED	09/92		1956	JP-4	25000	
20253	PMP STN, LF	130	REMOVED	09/92		1956	JP-4 +2040 ADD	25000	
20253	PMP STN, LF	176	ACTIVE/NIS			1992	JET FUEL	12000	
20253	PMP STN, LF	143	REMOVED	09/92		1956	2040 FUEL ADDIT	25000	
20253	PMP STN, LF	126	REMOVED	09/92		1956	JP-4	25000	

TABLE 3.15 (Continued)

BUILDING #	BUILDING DESCRIPTION	TANK #	STATUS	DATE REMOVED	TO BE REMOVED	YEAR INSTALLED	CONTENTS	VOLUME	REPLACEMENT
20253	PMP STN, LF	125	REMOVED	09/92		1956	JP-4	25000	
20253	PMP STN, LF	178	ACTIVE/NIS			1992	WASTE FUEL	12000	
20253	PMP STN, LF	175	ACTIVE/NIS			1992	JET FUEL	12000	
20253	PMP STN, LF	135	REMOVED	09/92		1956	JP-4	25000	
20253	PMP STN, LF	144	REMOVED	09/92		1956	JP-FUEL	25000	
20253	PMP STN, LF	131	REMOVED	09/92		1956	JP-4	25000	
20253	PMP STN, LF	137	REMOVED	09/92		1956	JP-4	25000	
20253	PMP STN, LF	136	REMOVED	09/92		1956	JP-4	25000	
20253	PMP STN, LF	142	REMOVED	09/92		1956	JP-5	25000	
20253	PMP STN, LF	129	REMOVED	09/92		1956	JP-4	25000	
20253	PMP STN, LF	140	REMOVED	09/92		1956	A-400 ADDITIVE	25000	
20253	PMP STN, LF	138	REMOVED	09/92		1956	JP-4	25000	
20253	PMP STN, LF	141	REMOVED	09/92		1956	SHALE	25000	
20253	PMP STN, LF	128	REMOVED	09/92		1956	JP-4	25000	
20253	PMP STN, LF	177	ACTIVE/NIS			1992	JET FUEL	12000	
20253	PMP STN, LF	132	REMOVED	09/92		1956	JP-4	25000	
20253	PMP STN, LF	134	REMOVED	09/92		1956	JP-4 +2040 ADD	25000	
20253	PMP STN, LF	133	REMOVED	09/92		1956	JP-4	25000	
20255	ACFT DY RSH LAB	410	REMOVED	07/91		-9	REMOVED	-9	
20255	ACFT DY RSH LAB	411	REMOVED	07/91		-9	NOT FOUND	-9	
20464	EXCH, SVC STN	48	ACTIVE		12/94	1970	MOGAS	5000	10000 G UST
20464	EXCH, SVC STN	173	ACTIVE		12/94	1970	WASTE OIL	1000	500 G UST
20464	EXCH, SVC STN	174	ACTIVE		12/94	1970	MOGAS UNLEADED	10000	10000 G UST
20464	EXCH, SVC STN	172	ACTIVE		12/94	1970	MOGAS REGULAR U	10000	10000 G UST

TABLE 3.15 (Continued)

BUILDING #	BUILDING DESCRIPTION	TANK #	STATUS	DATE REMOVED	TO BE REMOVED	YEAR INSTALLED	CONTENTS	VOLUME	REPLACEMENT
20490	PRPLN R-L FUEL/LUB	349	ACTIVE			1981	XYLENE	6000	
20490	PRPLN R-L FUEL/LUB	355	ACTIVE			1980	USED OIL/FUEL	6000	
20490	PRPLN R-L FUEL/LUB	348	ACTIVE			1980	NAPTHA	6000	
20490	PRPLN R-L FUEL/LUB	337	ACTIVE			1981	WASTE FUEL	10000	
20490	PRPLN R-L FUEL/LUB	342	ACTIVE			1980	JP-4	25000	
20490	PRPLN R-L FUEL/LUB	343	ACTIVE			1981	JP-4 SCRAP	25000	
20490	PRPLN R-L FUEL/LUB	344	ACTIVE			1980	JP-5	25000	
20490	PRPLN R-L FUEL/LUB	353	ACTIVE			1980	USED OUL/FUEL	1000	
20490	PRPLN R-L FUEL/LUB	338	ACTIVE			1981	STODDART SOLVENT	1000	
20490	PRPLN R-L FUEL/LUB	350	ACTIVE			1980	JP-4	6000	
20490	PRPLN R-L FUEL/LUB	345	ACTIVE			1980	JET FUEL	1000	
20490	PRPLN R-L FUEL/LUB	340	ACTIVE			1980	JP-4	1000	
20490	PRPLN R-L FUEL/LUB	346	ACTIVE			1981	JP-5	1000	
20490	PRPLN R-L FUEL/LUB	347	ACTIVE			1980	JP-5	1000	
20490	PRPLN R-L FUEL/LUB	339	ACTIVE			1980	JP-4	1000	
20490	PRPLN R-L FUEL/LUB	341	ACTIVE			1980	JP-4	25000	
20490	PRPLN R-L FUEL/LUB	352	ACTIVE			1980	JP-4	6000	
20490	PRPLN R-L FUEL/LUB	351	ACTIVE			1980	JP-7	6000	
20621	RSCH EQUIP STOR	113	ACTIVE			1974	FUEL OIL	1500	
20652		51	ACTIVE			1981	USED FUEL	550	
20654	SC LAB MATERIALS	418	ACTIVE			1985	WASTE HYDRAULIC	330	
20655	SC LAB MATERIALS	421	ACTIVE			1987	WASTE SOLVENTS	550	

TABLE 3.16

COOLING TOWERS

Outfall Area 3

BUILDING #	BUILDING DESCRIPTION	MAX BLOWDOWN (GAL/DAY)	DISCHARGE 1987	DISCHARGE 1993	SERVICE	COMMENTS
20018	PRPLN R-L A/BRETG	26600	SAN	STORM	ASD	LAB 8/ SAME TOWER SERVES 20018H
20018H	PRPLN R-L A/BRETG			STORM	ASD	LAB 8
20020	PRPLN R-L A/BRETG	1080	STORM		ABW	
20022	SC AVIONICS LAB	4900	STORM	STORM	ASD	LAB 9
20022B		4320	STORM	STORM	ASD	LAB 9
20023	SC LAB AVIONICS			SAN	ASD	LAB 9
20032	ACFT RSCH ENG	10800	SAN		ASD	LAB 7
20045	ACFT DY RSCH ENG	3420	SAN		ABW	
20052	ACFT RSCH ENG	4050	SAN		ABW	
20070	TECH LAB LF ANA	2700	SAN		ABW	
20071D	SC LAB MATERIALS	20000	STORM	STORM	ASD	LAB 8
20079	MEDICAL SCIENCE LABORATORY	5760	SAN	SAN	ASD	LAB 3
20125	HQ, SPECIFIED	720	SAN		ABW	
20125	HQ, SPECIFIED	1350	STORM		ABW	
20145	ACFT DY RSH TEST	6800	SAN	STORM	ASD	LAB 6
20146	ACFT DY RSH LAB	8200	SAN	STORM	ASD	LAB 6
20490	PRPLN R-L FUEL/LUB	6340	SAN	SAN	ASD	LAB 8
20640	TECH TNG LAB/SHP	6390	SAN		ABW	
20641	TECH TNG CLASSROOM	3240	SAN		ABW	
20651	SC LAB MATERIALS	40000	SAN	SAN	ASD	LAB 7/SAME TOWER SERVES 20652, 20653
20654	SC LAB MATERIALS	34600	SAN	SAN	ASD	LAB 7
20655	SC LAB MATERIALS			SAN	ASD	LAB 7

TABLE 3.17

HAZARDOUS WASTE GENERATORS

Outfall Area 3

BUILDING #	BUILDING DESCRIPTION	PERMIT #	ORGANIZATION	PHONE	ROOM NO.
20005	SHP ACFT GEN PURP	BS-012	TW/AMFSF	52677	K3 (PAINT SHOP)
20005	SHP ACFT GEN PURP	BS-011	TW/AMFSF	52677	M3 (METAL SHOP)
20005	SHP ACFT GEN PURP	BS-014	TW/AMFTD	57170	POST M13
20005	SHP ACFT GEN PURP	BS-086	TW/AMFSF	52677	K1 (PAINT STRIP)
20005	SHP ACFT GEN PURP	BS-013	TW/AMFTE	57101	0-9
20018G	PRPLN R-L A/BRETG	BS-090	WL/POOS-2	52372	30
20018G	PRPLN R-L A/BRETG	BS-022	WL/POOS-3	52922	42
20020A	PRPLN R-L A/BRETG	BA-102	WL/POT	56802	143
20022B		BS-019	WL/ELO	55410	C-135 CARGO BAY
20042	BE STOR CV FCLTY	BA-103	ABW/EMC	77152	
20059B	PRPLN R-L A/BRETG	BS-104	WL/POME	54013	SOUTH END
20062	PRPLN R-L A/BRETG	BS-105	WL/POME	54013	NE CORNER
20065	ACFT RSCH TEST	BS-071	WL/FIBT	53365	MEZZANINE EAST
20065	ACFT RSCH TEST	BA-070	WL/FIBT	53365	STORAGE SHED SE
20070	TECH LAB LF ANA	BS-082	SAALC/SFTL	52106	210
20070	TECH LAB LF ANA	BS-084	SAALC/SFTL	52106	115C
20070	TECH LAB LF ANA	BS-083	SAALC/SFTL	52106	115B
20070	TECH LAB LF ANA	BA-081	SAALC/SFTL	52106	110
20070	TECH LAB LF ANA	BS-085	SAALC/SFTL	52106	107
20071A	SC LAB MATERIALS	BA-091	WL/MLPJ	252-3132	A-BAY CABNET 4
20071A	SC LAB MATERIALS	BS-087	WL/MLPJ	252-3132	A-BAY #71A-A-1

TABLE 3.17 (Continued)

BUILDING #	BUILDING DESCRIPTION	PERMIT #	ORGANIZATION	PHONE	ROOM NO.
20071A	SC LAB MATERIALS	BS-088	WL/MLPJ	252-3132	C-BAY
20072	HAZARDOUS STORAGE, BSE	BA-016	TW/AMFS	57450	
20077	MED SCIENCE CHEMICAL STORAGE	BA-004	CL-RL/OET	55150	STORAGE SHED
20079	MEDICAL SCIENCE LABORATORY	BS-038	CL-RL/OET	55150	117
20092	RSCH EQUIP STOR	BA-002	WL/DOSH	50224	NONE
20094	ACFT RSCH TEST	BA-010	WL/FIVS	52661	CENTER PAD
20103	PHYSL TNG	BS-032	MED-CENTER	54566	B-184
20125	HQ, SPECIFIED	BS-039	DISAM/DAG	55542	2308
20125	HQ, SPECIFIED	BS-035	AFIT/ENG	51200	1065
20126	ACFT RSCH ENG	BS-029	ASC/ENES	56295	122
20145	ACFT DY RSH TEST	BS-028	WL/FIGL	58445	273
20146	ACFT DY RSH LAB	BS-026	WL/FIGL	58445	113
20146	ACFT DY RSH LAB	BS-027	WL/FIGL	58445	121
20146	ACFT DY RSH LAB	BS-025	WL/FIGL	58445	217
20146	ACFT DY RSH LAB	BS-020	WL/FIP	58261	122
20254	ACFT DY RSH LAB	BS-034	WL/XPN	50277	HIGH BAY
20435	PRPLN R-L A/BRETG	BS-106	WL/POME	54013	117
20490	PRPLN R-L FUEL/LUB	BS-073	WL/POSL	53100	235
20490	PRPLN R-L FUEL/LUB	BS-074	WL/POSL	53100	228
20490	PRPLN R-L FUEL/LUB	BA-001	WL/POS	56340	RM 122
20490	PRPLN R-L FUEL/LUB	BS-080	WL/POS	54027	206 F31
20640	TECH TNG LAB/SHP	BS-033	AFIT/ENP	54498	134F
20651	SC LAB MATERIALS	BS-065	WL/MLPO	54474	244
20651	SC LAB MATERIALS	BS-060	WL/MLPJ	56652	190

TABLE 3.17 (Continued)

BUILDING #	BUILDING DESCRIPTION	PERMIT #	ORGANIZATION	PHONE	ROOM NO.
20651	SC LAB MATERIALS	BS-062	WL/MLPO	54474	260
20651	SC LAB MATERIALS	BS-059	WL/MLPJ	54474	183
20651	SC LAB MATERIALS	BS-067	WL/MLPO	54474	261
20651	SC LAB MATERIALS	BS-058	WL/MLPJ	53808	163
20651	SC LAB MATERIALS	BS-061	WL/MLPJ	56652	192
20651	SC LAB MATERIALS	BS-021	WL/MLPT	53808	162
20651	SC LAB MATERIALS	BS-100	WL/MLPJ	53808	161
20652		BS-066	WL/MLBM	56386	135
20652		BS-092	WL/MLSE	55128	G-17
20652		BS-093	WL/MLSE	57484	145
20652		BS-098	WL/MLSA	55117	39
20652		BS-099	WL/MLSA	55117	50
20652		BS-068	WL/MLBM	56386	127
20654	SC LAB MATERIALS	BS-044	WL/MLBP	59138	304
20654	SC LAB MATERIALS	BS-078	WL/MLBT	59050	101
20654	SC LAB MATERIALS	BS-052	WL/MLBP	59138	331
20654	SC LAB MATERIALS	BS-050	WL/MLBP	59138	325
20654	SC LAB MATERIALS	BS-048	WL/MLBP	59138	332
20654	SC LAB MATERIALS	BS-097	WL/MLBC	53104	249
20654	SC LAB MATERIALS	BS-047	WL/MLBP	59138	302
20654	SC LAB MATERIALS	BS-045	WL/MLBP	59138	333
20654	SC LAB MATERIALS	BS-051	WL/MLBP	59138	326
20654	SC LAB MATERIALS	BS-053	WL/MLBP	59138	323/324
20654	SC LAB MATERIALS	BS-077	WL/MLBT	59052	152

TABLE 3.17 (Continued)

BUILDING #	BUILDING DESCRIPTION	PERMIT #	ORGANIZATION	PHONE	ROOM NO.
20654	SC LAB MATERIALS	BS-076	WL/MLBT	59050	149
20654	SC LAB MATERIALS	BA-040	WL/MLI	59038	CHEM STOR TRAIL
20654	SC LAB MATERIALS	BS-046	WL/MLBP	59138	303
20654	SC LAB MATERIALS	BS-049	WL/MLBP	59138	301
20654	SC LAB MATERIALS	BS-079	WL/MLBT	59039	133B
20654	SC LAB MATERIALS	BS-064	WL/MLBP	59138	334
20654	SC LAB MATERIALS	BS-054	WL/MLBP	59138	350
20654	SC LAB MATERIALS	BS-063	WL/MLBP	59138	349A
20655	SC LAB MATERIALS	BS-094	WL/MLLM	51314	83C/85C
20655	SC LAB MATERIALS	BS-095	WL/MLLM	59825	185
20655	SC LAB MATERIALS	BS-096	WL/MLLM	59825	183

Outfall Area 4

This drainage area is similar to Outfall Area 3 insofar as it houses a number of similar research and test facilities. It also exhibits springs and groundwater seepage from the Brassfield limestone formation which apparently contribute to elevated "background" flows in the storm drainage system. At 115 acres it is only about one fourth the size of Area 3.

Building 20038 is a vehicle maintenance shop which appears to qualify for industrial classification (paragraph viii, transportation, SIC-4581) insofar as it may service USAF vehicles associated with flying operations at the Base. Wastewater from vehicle washing activities is collected by an oil/water separator (Unit 19) which discharges to the sanitary sewer. No other facilities or landfill sites are present in Outfall Area 4 which qualify for industrial storm water classification.

Potential sources of storm water contamination are summarized in Table 3.18. The biodynamics lab in Building 20033 maintains and operates a centrifuge. Drains from the centrifuge sub floors are connected to an underground tank which is intended to contain hydraulic fluids in the event of a major disruption. This tank is also used to collect waste oils for recycle. Other floor drains in the building drain to the tank as well. Large volumes of water have been known to enter the tank, possibly from roof drains. This tank is scheduled for removal by December 1994 under the current Basewide program of underground tank removals.

No spills or leaks have been reported within Outfall Area 4 in the past three years. No other potential sources of storm water contamination have been noted. Tables 3.19 through 3.23 summarize oil/water separators, storage tanks, cooling towers, and hazardous waste generators within this area.

Outfall Area 4 is included on the current NPDES permit, where it is designated as NPDES discharge point 003. It is sampled monthly for TSS, pH, temperature, oil and grease, chromium, copper, and iron. Discharges at this sample point frequently exceed permit limits for TSS and iron, but have never exceeded permit limits for the other constituents. Iron exceedances are generally considered to be attributable to high concentrations of iron in the groundwater which enters the system through foundation sump pumps.

TABLE 3.18

INVENTORY OF FACILITIES WITH POTENTIAL STORM WATER IMPACTS

Outfall Area 4

BUILDING #	DESCRIPTION/FUNCTION	INDUSTRIAL CLASSIFICATION	WASTEWATER DISCHARGE	OTHER[1] POTENTIAL IMPACTS	NON-STORM DISCHARGE OR CROSS-CONNECTIONS	COMMENTS
20033	BIODYNAMICS - COMBINED STRESS LABORATORY	8734	NO	C	YES	FLOOR DRAINS TO WASTE OIL TANK WITH PROBLEM HISTORY. TANK SCHEDULED FOR REMOVAL.
20036	BE MAINTENANCE SHOP	4581 S.W. VIII.	NO	NONE	YES	AIR CONDITIONER CONDENSATE, POTENTIAL FLOOR DRAINS.
20038	VEHICLE MAINTENANCE SHOP	4581 S.W. VIII.	YES	B	NO	VEHICLE WASHING DRAINS TO OIL/WATER SEPARATOR, DRAINS TO SANITARY.
20055	EQUIP RSRCH LAB	8734	YES	NONE	YES	WASHING MACHINE DISCHARGE TO STORM.
20066	INACTIVE - SEALED OFF	EXEMPT	NO	NONE	YES	STORM WATER ACCUMULATION IN BASEMENT. PCB AND ASBESTOS CONTAMINATION.
20103	PHYSL TNG	8734	NO	E	YES	COOLANT WATER FROM AIR CONDITIONERS AND HYDRAULIC COMPRESSORS.

[1]SEE TABLE 3.2 FOR KEY.

TABLE 3.19

OIL/WATER SEPARATORS

Outfall Area 4

BUILDING #	BUILDING DESCRIPTION	UNIT #	SIZE (GALS)	DISCHARGE	REMARKS
20038	VEH MAINT SHOP	19	1200	SAN	

TABLE 3.20

ABOVE GROUND STORAGE TANKS

Outfall Area 4

BUILDING #	BUILDING DESCRIPTION	TANK #	DATE INST.	CAPACITY	TANK CONTENTS
20014	ACFT RSCH ENG	162	-9	25 GAL	GASOLINE
20025	ACFT DY RSH LAB	185	-9	125000 GAL	EMPTY
20025	ACFT DY RSH LAB	188	-9	125000 GAL	EMPTY
20025	ACFT DY RSH LAB	439	-9	4000 GAL	EMPTY
20025A	ACFT DY RSH LAB	350	-9	25 GAL	WASTE OIL/HYDRAULIC FLUID/H2O
20025	ACFT DY RSH LAB	186	-9	125000 GAL	EMPTY
20025	ACFT DY RSH LAB	187	-9	125000 GAL	EMPTY
20025A	ACFT DY RSH LAB	349	-9	55 GAL	WASTE OIL/HYDRAULIC FLUID/H2O
20025A	ACFT DY RSH LAB	351	-9	75 GAL	WASTE OIL/HYDRAULIC FLUID/H2O
20033	MED SCIENCE BIODYNAMICS	339	-9	55 GAL	WASTE OIL
20033	MED SCIENCE BIODYNAMICS	338	-9	55 GAL	WASTE OIL

TABLE 3.20 (Continued)

BUILDING #	BUILDING DESCRIPTION	TANK #	DATE INST.	CAPACITY	TANK CONTENTS
20033	MED SCIENCE BIODYNAMICS	337	-9	55 GAL	WASTE OIL
20033	MED SCIENCE BIODYNAMICS	342	-9	55 GAL	WASTE OIL
20033	MED SCIENCE BIODYNAMICS	345	-9	55 GAL	WASTE OIL
20033	MED SCIENCE BIODYNAMICS	343	-9	55 GAL	WASTE OIL
20033	MED SCIENCE BIODYNAMICS	341	-9	55 GAL	WASTE OIL
20033	MED SCIENCE BIODYNAMICS	344	-9	55 GAL	WASTE OIL
20033	MED SCIENCE BIODYNAMICS	340	-9	55 GAL	WASTE OIL
20076	FR STN	352	-9	55 GAL	WASTE OIL
20085A	WTR PMP STN	214	1992	6 TONS	LIQUID CO2
20085A	WTR PMP STN	170	1960	300 GAL	MOGAS
20085A	WTR PMP STN	169	-9	1000 GAL	DIESEL
20461	SC LAB SONIC	331	-9	55 GAL	WASTE OIL
20461	SC LAB SONIC	480	-9	55 GAL	WASTE SOLVENTS
20461	SC LAB SONIC	333	-9	55 GAL	WASTE OIL
20461	SC LAB SONIC	330	-9	55 GAL	WASTE OIL
20461	SC LAB SONIC	329	-9	55 GAL	WASTE OIL
20461	SC LAB SONIC	332	-9	55 GAL	WASTE OIL

TABLE 3.21

UNDERGROUND STORAGE TANKS

Outfall Area 4

BUILDING #	BUILDING DESCRIPTION	TANK #	STATUS	DATE REMOVED	TO BE REMOVED	YEAR INSTALLED	CONTENTS	VOLUME	REPLACEMENT
20011	ACFT RSCH ENG	25	REMOVED	NF		1942	REMOVED	250	
20011A		387	ACTIVE			1990	DIESEL	550	
20015	HQ CENTER	385	ACTIVE			1990	DIESEL	2500	
20033	MED SCIENCE BIODYNAMICS	52	ACTIVE/NIS		12/94	1966	WASTE HYDRAULIC	6000	2000 G UST
20038	VEH MAINT SHOP	77	REMOVED	04/92		1944	REMOVED	12000	
20051	ACFT RSCH ENG	76	REMOVED	01/92		-9	REMOVED	5500	
20051	ACFT RSCH ENG	74	REMOVED	01/92		-9	REMOVED	10000	
20051	ACFT RSCH ENG	75	REMOVED	01/92		-9	REMOVED	5500	
20067	ELEC PWR STN BLDG	83	ACTIVE		12/94	1942	DIESEL	5000	5000 G UST
20074	UTIL VAULT	386	ACTIVE			1990	DIESEL	1000	
20085A	WTR PMP STN	409	REMOVED	03/92		1959	NOT FOUND	250	
20085A	WTR PMP STN	407	REMOVED	03/92		1959	NOT FOUND	250	
20085A	WTR PMP STN	406	REMOVED	03/92		1959	NOT FOUND	250	
20085A	WTR PMP STN	404	REMOVED	1992		1959	NOT FOUND	250	
20085A	WTR PMP STN	405	ACTIVE		12/94	1959	DIESEL	250	250 G UST
20085A	WTR PMP STN	408	REMOVED	03/92		1959	NOT FOUND	250	
20248	MEDICAL SCIENCE LAB/H ENG	370	ACTIVE			1991	NOT INSTALLED	-9	
20461	SC LAN SONIC	149	REMOVED	1992		-9	REMOVED		

TABLE 3.22

COOLING TOWERS

Outfall Area 4

BUILDING #	BUILDING DESCRIPTION	MAX BLOWDOWN (GAL/DAY)	DISCHARGE 1987	DISCHARGE 1993	SERVICE	COMMENTS
20011	ACFT RSCH ENG	7200	SAN		ABW	
20012	ACFT RSCH ENG	4500	SAN		ABW	
20014	ACFT RSCH ENG	4320	SAN		ABW	
20028A	ACFT RSCH ENG	4500	SAN		ABW	
20032	ACFT RSCH ENG	10800	SAN		ASD	LAB 7
20051	ACFT RSCH ENG	2700	SAN		ABW	
20051	ACFT RSCH ENG	2700	SAN		ABW	
20051	ACFT RSCH ENG	2250	SAN		ABW	
20056	ACFT RSCH ENG	2700	SAN		ABW	
20057	ACFT RSCH ENG	1800	SAN		ABW	
20057	ACFT RSCH ENG	2250	SAN		ABW	
20248	MEDICAL SCIENCE LAB/H ENG	6900	SAN	SAN	ASD	LAB 3

TABLE 3.23

HAZARDOUS WASTE GENERATORS

Outfall Area 4

BUILDING #	BUILDING DESCRIPTION	PERMIT #	ORGANIZATION	PHONE	ROOM NO.
20016	ACFT RSCH ENG	BS-043	ASC/SCNCS	57017	21
20016	ACFT RSCH ENG	BS-015	MSSQ/MSIRR	55483	0011/0012
20025B	ACFT DY RSH LAB	BS-108	WL/FI	56317	NW CORNER
20036	BE MAINT SHOP	BA-007	CEOEZ	73904	ZONE B-1
20103	PHYSL TNG	BS-032	MED-CENTER	54566	B-184

Outfall Area 5

Outfall Area 5 covers the eastern quarter of old Wright Field. it includes some research and test facilities similar to those described previously. The AFIT also occupies a substantial portion of this area. Several facilities are present which fit the criteria for industrial storm water classification. These include:

- DRMO recycle facilities (paragraph vi) at Buildings 20741, 20743 and 20746.

- The coal fired power plant (paragraph vii) at 20770.

- CE grounds and equipment (paragraph viii) at 20745.

- Landfill Numbers LF8, LF10, and EFD26 administered by IRP (paragraph v).

The Defense Reutilization and Marketing Office (DRMO) is responsible for a wide range of materials recycling initiatives including scrap metals, used solvents, used oils, office furnishings, aircraft components, etc. A variety of bulk materials are stored outside at building locations 20741/743. The DRMO also operates and manages the PCB conforming storage area at Building 20746. A number of problems have been documented through the ECAMP 92 inspections and other sources, including materials blowing off the property line, accumulation of inappropriate materials, and lack of storm water controls. While visual inspection of the storage yards indicates that some improvement has occurred, the fundamental issues of preventing storm water contamination have not yet been fully resolved.

Outside storage of materials in the DRMO area includes a large scrap metal yard, mechanical equipment, electrical equipment, office furniture, and other miscellaneous items. There is no curbing, containment, settling basins, overhead roofing, or other means of storm water control in place. All storm water flows off the storage areas directly to storm drains or surface flow. There is also no procedure in place to drain or verify that material has been drained of fluids, refrigerants, hydraulics, etc.

CE Grounds and Equipment operates a vehicle maintenance facility at 20745 for the provision of general landscaping and roadway maintenance services to Area B. The yard area includes a salt storage dome and salt loadout area which is subject to frequent spillage because the loader scoop is too wide for the truck hoppers. The wash rack at the north end of the facility is connected to a storm drain and its use is currently restricted to water rinsing only. However, salt and dirt which is rinsed from equipment can flow to the storm drain. Floor drains may also be connected to storm lines, their status is unconfirmed. Finally, soil stockpiles located south of the building are unprotected and are discharging sediment to the storm drainage system.

The heating plant at 20770 has experienced ongoing problems with storm water discharge and windblown deposition from its coal storage area for a number of years. Runoff from the coal storage area and other aqueous waste streams are conveyed to a clarifier prior to being discharged to the storm drainage system. The clarifier has been noted by several sources for poor performance. A project to address these deficiencies (#920207) is programmed for Fiscal Year 1994.

All of the disposal sites within Outfall Area 5 are inactive and administered by IRP. The sites are covered and protected from exposure to storm water infiltration. Further discussion of the DRMO yards, heating plants, CE yard, and landfill sites are presented in Section 5.

Other facilities with potential storm water impacts, in addition to those subject to industrial classification, are presented in Table 3.24. Identified problems include cooling tower discharges to storm drains (two units at 20450); and suspected discharges from two acid neutralization pits to storm drains at Building 20450. Summary information on storage tanks, cooling towers, and hazardous waste generators are presented in Tables 3.26-3.29.

The three-year history of reported spills (Table 3.25) indicates two events which may qualify as significant with respect to storm water rules. However, complete information regarding these incidents was not available from the summary of reports. If either spill occurred in an environment which precludes potential exposure to storm water (i.e., inside a building with no floor drains to storm), they need not be included on the list.

TABLE 3.24

INVENTORY OF FACILITIES WITH POTENTIAL STORM WATER IMPACTS

Outfall Area 5

BUILDING #	DESCRIPTION/FUNCTION	INDUSTRIAL CLASSIFICATION	WASTEWATER DISCHARGE	OTHER[1] POTENTIAL IMPACT	NON-STORM DISCHARGE OR CROSS-CONNECTION	COMMENTS
20433	NAVY MED RESEARCH - TOXICOLOGY	8733	NO	C,E	YES	BUILDING DRAINS DISCHARGE TO INACTIVE ACID PIT TO UNKNOWN.
20450	ACFT DY RSH LAB	8734	YES	C,D,E	YES	MAIN COOLING TOWER BLOWDOWN DISCHARGE TO STORM. ROOF COOLING TOWER (VIA ROOM E013) TO STORM. ACTIVE ACID NEUTRALIZATION PITS AT B-WING AND E-WING TO STORM. LAB DRAINS AND SINKS TO PITS.
20452	CHEM STORAGE BLDG @ 20450	8734	NO	NONE	YES	DRAINS TO E-WING ACID PIT TO STORM.
20456	ANNEX TO 20450	8734	NO	NONE	NO	SUMP PUMP IN EQUIPMENT PIT TO STORM.
20682	FILM PRESERVATION LAB	8733	YES	E	NO	FORMER OUTSIDE STORAGE HAZARDOUS MATERIAL (MAY HAVE NEW SHED NOW).
20741 20743	DRMO RECYCLE/SCRAP YARDS	S.W. VI.	NO	C	YES	ECAMP 1992 CITATION OF SCRAP YARD AREAS AS UNPERMITTED LANDFILL. NO STORM WATER CONTROLS FOR OUTSIDE STORAGE.
20745	CE GROUNDS AND EQUIPMENT	4581 S.W. VIII.	NO	C,E	YES	1992 STORM WATER RUN-ON TO ROAD SALT STORAGE. OUTSIDE WASH RACK DISCHARGES TO STORM, FLOOR DRAINS PROBABLE.
20746	DRMO RECYCLE/PCB STORAGE	S.W. VI.	NO	C	NO	ECAMP 1992 CITATIONS: RAINWATER INFILTRATION; CITATIONS CORRECTED AS OF JANUARY 1994. OUTSIDE STORAGE OF DRUMS.
20770	HEATING PLANT	S.W. VII.	YES	C,E	YES	COAL PILE RUN-OFF TO CLARIFIER TO SURFACE DRAINAGE. CLARIFIER NOTED FOR POOR PERFORMANCE (POLLUTION PREVENTION REPORTS).

[1]SEE TABLE 3.2 FOR KEY.

TABLE 3.25

HAZARDOUS MATERIAL AND FUEL SPILL INCIDENTS

Outfall Area 5

BUILDING #	DATE	REMARKS
20090	8/1/92	14-15 GAL MURIATIC/HYDROCHLORIC ACID SPILLED ON FLOOR.
20838	7/31/93	PORT BOILER LEAKING FUEL, BROKEN FUEL LINE (20 GAL).

TABLE 3.26

ABOVE GROUND STORAGE TANKS

Outfall Area 5

BUILDING #	BUILDING DESCRIPTION	TANK #	DATE INST.	CAPACITY	TANK CONTENTS
20329	MISC RECTN BLD	452	-9	275 GAL	DIESEL
20349	ELEC PWR STN BLDG	166	1975	55 GAL	MOGAS
20433	MEDICAL SCIENCE LAB	242	-9	300 GAL	
20450	ACFT DY RSH LAB	266	1990	22 TONS	SALT BRINE
20450	ACFT DY RSH LAB	267	-9	1700 GAL	LIQUID NITROGEN
20450	ACFT DY RSH LAB	265	-9	750 GAL	LIQUID NITROGEN
20450	ACFT DY RSH LAB	268	-9	500 GAL	LIQUID NITROGEN
20453	BLDG WATER SUP	259	-9	30 TON	SODIUM CHLORIDE
20684	GYMNASIUM	382	-9	160 GAL	BRINE
20740	BE STOR CV FCLTY	395	-9	5400 GAL	CALCIUM CHLORIDE SOLUTION
20741	WSHE SUP & EQUIP BSE	314	-9	300 GAL	DIESEL FUEL
20741	WSHE SUP & EQUIP BSE	315	-9	300 GAL	DIESEL FUEL
20743	WSE SUP & EQUIP BSE	313	-9	300 GAL	HEATING OIL
20745	BE PAV GRND FCLTY	396	-9	275 GAL	DIESEL
20745	BE PAV GRND FCLTY	397	-9	275 GAL	DIESEL
20770	HTG FCLTY BLDG	260	1973	3000 GAL	SULFURIC ACID
20770	HTG FCLTY BLDG	263	-9	300 GAL	EMPTY
20770	HTG FCLTY BLDG	261	-9	1500 GAL	DIESEL FUEL
20770	HTG FCLTY BLDG	92	1985	3000 GAL	SULFURIC ACID
20770	HTG FCLTY BLDG	262	-9	300 GAL	EMPTY
20770	HTG FCLTY BLDG	264	-9	600 GAL	EMPTY
20824	MEDICAL SCIENCE LAB	301	-9	55 GAL	EMPTY
20824	MEDICAL SCIENCE LAB	302	-9	55 GAL	EMPTY

TABLE 3.27

UNDERGROUND STORAGE TANKS

Outfall Area 5

BUILDING #	BUILDING DESCRIPTION	TANK #	STATUS	DATE REMOVED	TO BE REMOVED	YEAR INSTALLED	CONTENTS	VOLUME	REPLACEMENT
20451	ACFT DY RSH TEST	335	ACTIVE		12/94	1973	USED OIL	1000	1000 G UST
20621	RSCH EQUIP STOR	113	ACTIVE			1974	FUEL OIL	1500	
20743	WSE SUP & EQUIP BSE	322	ACTIVE			1981	MOGAS	1000	
20770	HTG FCLTY BLDG	28	ACTIVE			1980	DIESEL	3000	
20838	MEDICAL SCIENCE LAB	86	ACTIVE		12/94	1963	DIESEL	2000	2000 G AST

TABLE 3.28

COOLING TOWERS

Outfall Area 5

BUILDING #	BUILDING DESCRIPTION	MAX BLOWDOWN (GAL/DAY)	DISCHARGE 1987	DISCHARGE 1993	SERVICE	COMMENTS
20450	ACFT DY RSH LAB	10100	STORM	STORM	ASD	LAB 5
20451	ACFT DY RSH TEST	23000	STORM	STORM	ASD	LAB 5
20676	DPI	6750	SAN		ABW	
20838	MEDICAL SCIENCE LAB	4320	SAN	SAN	ASD	LAB 3

TABLE 3.29

HAZARDOUS WASTE GENERATORS

Outfall Area 5

BUILDING #	BUILDING DESCRIPTION	PERMIT #	ORGANIZATION	PHONE	ROOM NO.
20433	MEDICAL SCIENCE LAB	BS-069	NMRI/TD	56058	BEHIND BLD
20450	ACFT DY RSH LAB	BS-101	WL/MLSA	55119	B011
20682	MOTION PICTURE LAB	BS-008	LCMPS/MPPL	55014	125
20745	BE PAV GRND FCLTY	BA-041	CES/DEMGHG	56886	NW END BY SALT
20770	HTG FCLTY BLDG	BS-036	ENSG/DEMPO	50771	BASEMENT

Outfall Area 6

Outfall Area 6 is located at the south end of Patterson Field (Area A) and includes entrance gates 12A and 15A. There are no facilities or activities in this area subject to industrial storm water classification. Substantial portions of the surface area are devoted to a parking lot serving administrative facilities in Areas 6 and 7.

Tables 3.30 through 3.33 summarize facilities, storage tanks, and hazardous waste generators in this area. The entomology shop stores all pesticides and herbicides used by on-Base organizations. Materials applied by CE Grounds are mixed at the shop while materials applied to golf courses are distributed to the appropriate maintenance units. A private contractor maintains lawns and grounds in the residential portion of the Base.

The entomology shop is a new facility which is well designed to prevent any exposure to storm waters. The outside work area where truck mounted application tanks are prepared is protected by a large overhead canopy and is graded to prevent any storm flow run-on. Staff at the entomology shop also supervise mixing operations at the golf shops, which are also well protected against the weather. A more detailed discussion of pesticide/herbicide operations at WPAFB is presented in Section 5.

A suspect underground storage tank is located at the fuel station (10298). This tank has been emptied and taken out of service. Four of the eight underground tanks within Area 6 are scheduled for removal during 1994.

No spills or leaks have been reported within this area during the past three years.

TABLE 3.30

INVENTORY OF FACILITIES WITH POTENTIAL STORM WATER IMPACTS

Outfall Area 6

BUILDING #	DESCRIPTION/FUNCTION	INDUSTRIAL CLASSIFICATION	WASTEWATER DISCHARGE	OTHER[1] POTENTIAL IMPACTS	NON-STORM DISCHARGES OR CROSS-CONNECTION	COMMENT
10278	ENTOMOLOGY	0782	NO	E	NO	PESTICIDE MIXING FULLY CONTAINED. VEHICLE WASHING TO SANITARY.
10298	FUEL STATION/STORAGE AREA	5541	NO	C	NO	ECAMP 1992 CITATION: OLD OIL SPILLS NOT FULLY CLEANED UP. NEGATIVE INVENTORY AT UST REPORTED. TANK SCHEDULED FOR REMOVAL.

[1]SEE TABLE 3.2 FOR KEY.

TABLE 3.31

ABOVE GROUND STORAGE TANKS

Outfall Area 6

BUILDING #	BUILDING DESCRIPTION	TANK #	DATE INST	CAPACITY	TANK CONTENTS
10298	VEH FL STN	16	-9	1000 GAL	MOGAS UNLEADED
10298	VEH FL STN	189	1993	1000 GAL	DIESEL
30260	HQ CENTER	1	-9	275 GAL	DIESEL

TABLE 3.32

UNDERGROUND STORAGE TANKS

Outfall Area 6

BUILDING #	BUILDING DESCRIPTION	TANK #	STATUS	DATE REMOVED	TO BE REMOVED	YEAR INSTALLED	CONTENTS	VOLUME	REPLACEMENT
10266	HQ MAJOR COMMAND	241	REMOVED	10/89		1964	REMOVED	4000	
10266	HQ MAJOR COMMAND	364	ACTIVE			1988	DIESEL	4000	
10271	HTG FCLTY BLDG	381	ACTIVE			1989	#2 DIESEL	25000	
10271	HTG FCLTY BLDG	380	ACTIVE			1989	#2 DIESEL	25000	
10277	ELEC PWR STN BLDG	242	REMOVED	1992		1964	FUEL OIL	275	
10277	ELEC PWR STN BLDG	309	ACTIVE		12/94	1964	DIESEL	5000	5000 G UST
10291		441	ACTIVE			1984	DIESEL	550	
10298	VEH FL STN	245	ACTIVE		12/94	1952	DIESEL	10000	5000 G UST
10298	VEH FL STN	244	ABANDONED		12/94	1952	MOGAS	10000	2000 G UST
11456	HTG FCLTY BLDG	268	REMOVED	07/91		1956	REMOVED	10000	
11456	HTG FCLTY BLDG	266	ACTIVE		12/94	1966	DIESEL	1000	
11456	HTG FCLTY BLDG	267	REMOVED	07/91		1956	REMOVED	10000	

TABLE 3.33

HAZARDOUS WASTE GENERATORS

Outfall Area 6

BUILDING #	BUILDING DESCRIPTION	PERMIT #	ORGANIZATION	PHONE	ROOM NO.
10278	BE MAINT SHOP	AS-008	DEMIUE	73593	
11405	SHP MET EUIP	AS-009	CCSG/SCMLR	77805	136

Outfall Area 7

This drainage area includes CE Pavement and Grounds (Buildings 10876/877 and adjacent areas), which is subject to industrial classification under paragraph viii - Airports. The warehouses at 10280 and 10281 may also be subject to classification under paragraph xi, if these facilities are correctly classified under SIC Code 4225. These facilities are summarized on Table 3.34. Inactive landfills (LF3 and LF4) are also located within Outfall Area 7 (see Section 5).

The Pavement and Grounds facility includes a large equipment building (10879) which discharges from floor drains to an oil/water separator (Unit #15). An outdoor wash rack adjacent to 10877 also discharges to this separator which subsequently discharges to a sanitary sewer. The yard area includes a covered salt dome, stockpiles of used asphalt and other roadway material, snow plowing equipment, and vehicles and machinery. The yard is partially paved with cracked, poor quality asphalt and is on a slight slope which may be subject to sheet flow runoff from areas south of the yard. The salt dome appears to be adequate, but may be subject to rainfall run-on. An underground storage tank at the facility was recently emptied and taken out of service and is scheduled for removal during 1994.

The warehouses appear to be adequately constructed for their current uses and do not constitute potential sources of storm water contamination. Two chillers are located at these buildings which discharge cooling water to storm drains in the adjacent parking lots. If this cooling water fits the definition of an uncontaminated potable water source, then such discharge is authorized under the USEPA General Permit. However, if materials such as biocides or rust inhibitors have been added to this water, then such discharges should be diverted to the sanitary system.

No leaks or spills of hazardous or toxic materials have been reported for Outfall Area 7 during the past three years and other items of concern have been identified. Tables 3.35 through 3.39 provide summary information for the area.

TABLE 3.34

INVENTORY OF FACILITIES WITH POTENTIAL STORM WATER IMPACTS

Outfall Area 7

BUILDING #	DESCRIPTION/FUNCTION	INDUSTRIAL CLASSIFICATION	WASTEWATER DISCHARGE	OTHER[1] POTENTIAL IMPACTS	NON-STORM DISCHARGE OR CROSS-CONNECTION	COMMENTS
10280 10281	WAREHOUSE, SMALL PHOTO & PRINT LAB	4225 S.W. XI.	YES	E	YES	DISCHARGE FROM TWO CHILLERS TO STORM SEWERS.
10876	CE PAVEMENT & GROUNDS	4581 S.W. VIII.	YES	C	YES	RAINFALL RUN-ON TO STORAGE/SCRAP YARD AND SALT DOME HAS NO DIVERSION. POOR QUALITY PAVING IN SCRAP YARD.
10877	CE PAVEMENT & GROUNDS	4581 S.W. VIII.	YES	B,C	NO	ECAMP 1992 CITATION; SPILLED OIL ADJACENT AST NOT CLEANED UP.

[1]SEE TABLE 3.2 FOR KEY.

TABLE 3.35

OIL/WATER SEPARATORS

Outfall Area 7

BUILDING #	BUILDING DESCRIPTION	UNIT #	SIZE(GALS)	DISCHARGE	REMARKS
10877	BE PAV GRND FCLTY	15	1200	SAN	

TABLE 3.36

ABOVE GROUND STORAGE TANKS

Outfall Area 7

BUILDING #	BUILDING DESCRIPTION	TANK #	DATE INST.	CAPACITY	TANK CONTENTS
10262	HQ MAJOR COMMAND	243	1982	1500 GAL	EMPTY
10262	HQ MAJOR COMMAND	190	1993	1500 GAL	EMPTY
10266	HQ MAJOR COMMAND	46	1991	200 GAL	DIESEL
10876	BE PAV GRND FCLTY	13	-9	275 GAL	#1 DIESEL
10877	BE PAV GRND FCLTY	93	-9	270 GAL	USED MOTOR OIL
10878	BE PAV GRND FCLTY	15	1973	275 GAL	KEROSENE
10878	BE PAV GRND FCLTY	14	1980	300 GAL	DIESEL

TABLE 3.37

UNDERGROUND STORAGE TANKS

Outfall Area 7

BUILDING #	BUILDING DESCRIPTION	TANK #	STATUS	DATE REMOVED	TO BE REMOVED	YEAR INSTALLED	CONTENTS	VOLUME
10263	COMM FACILITY	425	REMOVED	NF		-9	REMOVED	-9
10266	HQ MAJOR COMMAND	241	REMOVED	10/89		1964	REMOVED	4000
10266	HQ MAJOR COMMAND	364	ACTIVE			1988	DIESEL	4000
10271	HTG FCLTY BLDG	380	ACTIVE			1989	#2 DIESEL	25000
10271	HTG FCLTY BLDG	381	ACTIVE			1989	#2 DIESEL	25000
10878	BE PAV GRND FCLTY	240	ACTIVE		12/94	1973	UNLEADED MOGAS	1000

TABLE 3.38

COOLING TOWERS

Outfall Area 7

BUILDING #	BUILDING DESCRIPTION	MAX BLOWDOWN (GAL/DAY)	DISCHARGE 1987	DISCHARGE 1993	SERVICE	COMMENTS
10262	HQ MAJOR COMMAND	30600	SAN		ABW	
10280	HQ MAJOR COMD	1800	STORM		ABW	

TABLE 3.39

HAZARDOUS WASTE GENERATORS

Outfall Area 7

BUILDING #	BUILDING DESCRIPTION	PERMIT #	ORGANIZATION	PHONE	ROOM NO.
10281	WSHE, FORM & PUB BSE	AS-001	DPSDO	76014	OUTSIDE SHED
10867	BE PAV GRND FCLTY	AS-007	FASTC/LEM	74021	HANGER A

Outfall Areas 8, 9, 10 and 11

These outfalls include administrative facilities, the Base hospital, housing, and recreational facilities. There are no activities or sites in these areas subject to industrial classification. No hazardous or toxic spills have been reported from these areas for the past three years. Tables 3.40 through 3.48 summarize storage tanks and related equipment within these areas.

TABLE 3.40

ABOVE GROUND STORAGE TANKS

Outfall Area 8

BUILDING #	BUILDING DESCRIPTION	TANK #	DATE INST.	CAPACITY	TANK CONTENTS
10829	PHOTO LAB, RECON	207	-9	4500 GAL	SALT WATER
10829	PHOTO LAB, RECON	50	-9	30 GAL	DIESEL
10856	OPS, SP	433	1993	500 GAL	FUEL OIL

TABLE 3.41

UNDERGROUND STORAGE TANKS

Outfall Area 8

BUILDING #	BUILDING DESCRIPTION	TANK #	STATUS	DATE REMOVED	TO BE REMOVED	YEAR INSTALLED	CONTENTS	VOLUME
10856	OPS, SP	29	ACTIVE			1976	#2 DIESEL	2000

TABLE 3.42

COOLING TOWERS

Outfall Area 8

BUILDING #	BUILDING DESCRIPTION	MAX BLOWDOWN (GAL/DAY)	DISCHARGE 1987	DISCHARGE 1993	SERVICE	COMMENTS
10828	OPS, SP	6480	SAN		ABW	
10828	OPS, SP	3060	SAN		ABW	
10856	OPS, SP	20700	SAN		ABW	

TABLE 3.43

ABOVE GROUND STORAGE TANKS

Outfall Area 9

BUILDING #	BUILDING DESCRIPTION	TANK #	DATE INST.	CAPACITY	TANK CONTENTS
10830	COMPOSITE MED	126	-9	3125 GAL	LIQUID OXYGEN
10830	COMPOSITE MED	127	-9	1500 GAL	LIQUID OXYGEN
10830	COMPOSITE MED	42	1980	350 GAL	DIESEL
10840		125	1992	1573 GAL	EMPTY
10857	BLDG WTR SUP	141	1992	14 TON	LIQUID CARBON DIOXIDE

TABLE 3.44

UNDERGROUND STORAGE TANKS

Outfall Area 9

BUILDING #	BUILDING DESCRIPTION	TANK #	STATUS	DATE REMOVED	TO BE REMOVED	YEAR INSTALLED	CONTENTS	VOLUME
10827	AIR COND PLT BLDG	99	ACTIVE			1980	KEROSENE	1000
10830	COMPOSITE MED	330	REMOVED	NF		-9	REMOVED	3000
10830	COMPOSITE MED	95	ACTIVE			1984	#2 DIESEL	25000
10830	COMPOSITE MED	98	ACTIVE			1984	#1 DIESEL	8000
10830	COMPOSITE MED	96	ACTIVE			1984	#2 DIESEL	25000
10830	COMPOSITE MED	317	REMOVED	NF		1956	REMOVED	5000
10830	COMPOSITE MED	97	ACTIVE			1984	#2 DIESEL	25000
10855	WATER PMP STN	248	ACTIVE			1979	#1 DIESEL	500
10855	WATER PMP STN	247	ACTIVE			1979	#1 DIESEL	500

TABLE 3.45

COOLING TOWERS

Outfall Area 9

BUILDING #	BUILDING DESCRIPTION	MAX BLOWDOWN (GAL/DAY)	DISCHARGE 1987	DISCHARGE 1993	SERVICE	COMMENTS
10825	VOQ	3840	SAN		ABW	
10826	VOQ	2700	SAN		ABW	
10827	AIR COND PLT BLDG	2340	SAN		ABW	
10830	COMPOSITE MED	2700	SAN		ABW	
10840		18000	SAN		ABW	

TABLE 3.46

UNDERGROUND STORAGE TANKS

Outfall Area 10

BUILDING #	BUILDING DESCRIPTION	TANK #	STATUS	DATE REMOVED	TO BE REMOVED	YEAR INSTALLED	CONTENTS	VOLUME	REPLACEMENT
10061	GOLF CLUBHSE/EQUIP	239	ACTIVE		12/94	1973	MOGAS	500	500 G AST

TABLE 3.47

ABOVE GROUND STORAGE TANKS

Outfall Area 11

BUILDING #	BUILDING DESCRIPTION	TANK #	DATE INST.	CAPACITY	TANK CONTENTS
10813	GOLF CLUBHSE/EQUIP	140	-9	275 GAL	DIESEL

TABLE 3.48

COOLING TOWERS

Outfall Area 11

BUILDING #	BUILDING DESCRIPTION	MAX BLOWDOWN (GAL/DAY)	DISCHARGE 1987	DISCHARGE 1993	SERVICE	COMMENTS
10800	OPEN MESS, OFF	3600	SAN		ABW	
10800	OPEN MESS, OFF	5400	SAN		ABW	

Outfall Area 12

Outfall Area 12 includes a number of facilities subject to industrial storm water classification. Several vehicle maintenance shops classify under paragraph viii - Support of Airport Operations. The central heating plant is classified under paragraph vii. Several facilities providing warehouse and shipping/receiving services appear to be most appropriately classified under paragraph xi, SIC 4225. There are no landfill or disposal sites administered by the IRP within this area.

Table 3.49 summarizes the potential storm water impacts of industrial and other facilities within this drainage area. Identified problems include apparent structural deficiencies at a hazardous materials handling facility, suspect discharge from an oil/water separator (30060), and runoff problems from the coal storage area. Other facilities are included (30257, 30884, 30901) which appear to offer little or no potential for storm water contamination. Operations at these facilities are fully enclosed.

The warehouse at 30257 provides an example of a materials handling facility which is constructed and operating in a manner appropriate to materials stored there and which minimizes potential exposure to storm water. The building is constructed on an elevated foundation so that floor level and loading docks are the same height as delivery trucks. Overhead canopies at the docks and receiving door aprons protect materials against exposure to rainfall. Inside the warehouse, stringent housekeeping standards are enforced to maintain a clean and well ordered storage environment. Drip pans are employed under fork lifts and other machinery whenever they are not in operation and equipment condition is monitored through daily inspection of the pans. Leaking equipment is immediately taken out of service and repaired.

Hazardous material and fuel spill incidents reported during the past three years have occurred at two of the materials handling facilities in this area. As discussed earlier, more detailed review of these events may result in some or all being exempted from the storm water definition of significant spills. The available spill information is summarized in Table 3.50.

Tables 3.51 through 3.55 present summary information for oil/water separators, storage tanks, cooling towers, and permitted hazardous waste generators within Outfall Area 12. No additional points of concern are revealed by these sources.

TABLE 3.49

INVENTORY OF FACILITIES WITH POTENTIAL STORM WATER IMPACTS

Outfall Area 12

BUILDING #	DESCRIPTION/ FUNCTION	INDUSTRIAL CLASSIFICATION	WASTEWATER DISCHARGE	OTHER[1] POTENTIAL IMPACTS	NON-STORM DISCHARGE OR CROSS-CONNECTION	COMMENTS
30002	WAREHOUSE AND HAZMAT STORAGE	4225 S.W. XI.	NO	A,D	YES (POTENTIAL)	RAINFALL RUN-IN AT DOORS 5 & 6, WAREHOUSE FLOOR AT GROUND LEVEL. UNPROTECTED LOADING AREA. CLOGGED FLOOR DRAIN IN ANNEX, 2D.
30055 30058 30060	VEHICLE MAINTENANCE SHOP	4581 S.W. VIII.	YES	B,C	YES	STORM DRAIN TO OIL/WATER SEPARATOR AT 30060 SHOULD BE DISCONNECTED. OUTSIDE FUEL PUMPS EXPOSED TO STORM WATER RUN-ON.
30070	MWR SHP/NAF C-STOR	4225 S.W. XI.	NO	D,E	NO	GENERAL WAREHOUSING OPERATIONS ENCLOSED.
30174	MATERIAL SERVICES (HOSPITAL SUPPLIES)	4225 S.W. XI.	NO	A,E	NO	PAST HISTORY CHEMICAL SPILLS CORRECTED.
30257	WAREHOUSE, AIRCRAFT TIRES	4225 S.W. XI.	NO	NONE	NO	ELEVATED FLOORS, PROTECTED DOORS, NO FLOOR DRAINS, EQUIPMENT DRIP PANS IN USE.
30884	INSTRUMENT CALIBRATION & MAINTENANCE	7699	NO	C,D,E	NO	ALL OPERATIONS ENCLOSED.
30901	VEHICLE MAINTENANCE PAINT SHOP	4581 S.W. VIII.	YES	B,E	NO	ALL OPERATIONS ENCLOSED.
31240	CENTRAL HEATING PLANT	S.W. VII.	YES	C	YES	RUN-OFF FROM COAL PILES TO CLARIFIER TO STORM DITCH; LOW PH DISCOLORED WATER. FY 1994 PROJECT TO UPGRADE.
31244	H/SHP, AUTOMOTIVE	4581 S.W. VIII.	NO	B,C,E	NO	ECAMP 1992 CITATION: INADEQUATE CLEAN-UP OF OLD OIL SPILL NEAR TANK.

[1]SEE TABLE 3.2 FOR KEY.

TABLE 3.50

HAZARDOUS MATERIAL AND FUEL SPILL INCIDENTS

Outfall Area 12

BUILDING #	DATE	REMARKS
30002	8/9/91	AFFF LEAK
30174	8/21/91	XYLENE SPILL AT LOADING DOCK, 4 GAL, CONTAINED IN CART.
30174	11/6/91	2 CONTAINERS (EA 5 GAL) LEAKED ETHYL ALCOHOL, OVER-PACKED, SPEEDI DRI.
30174	7/1/93	XYLENE SPILL - CLASS 1 - INSIDE DRUM, CONTAINED IN DRUM.

TABLE 3.51

OIL/WATER SEPARATORS

Outfall 12

BUILDING #	BUILDING DESCRIPTION	UNIT #	SIZE(GALS)	DISCHARGE	REMARKS
30055	VEH MAINT SHOP	38	4700	SAN	HAS OIL STORAGE TANK
30060	VEH MAINT SHOP	18	800	SAN/STORM	
30901	VEH MAINT SHOP	37	600	SAN	
31244	H/SHP, AUTOMOTIVE	27A	50	SAN	
31244	H/SHP, AUTOMOTIVE	29	1500	SAN	HAS OIL STORAGE TANK
31244	H/SHP, AUTOMOTIVE	27B	50	SAN	

TABLE 3.52

ABOVE GROUND STORAGE TANKS

Outfall Area 12

BUILDING #	BUILDING DESCRIPTION	TANK #	DATE INST.	CAPACITY	TANK CONTENTS
30059	EOD	453	1993	500 GAL	DIESEL
30199	RECREATION CENTER	76	-9	275 GAL	DIESEL
30208	VEH OPS HEAT PKNG	291	-9	1000 GAL	DIESEL
31216	DORM AM PP/PCS-STD	113	-9	1050 GAL	DIESEL FUEL
31240	HTG FCLTY BLDG	68	1978	55 GAL DRUM	KEROSENE
31240	HTG FCLTY BLDG	66	1978	55 GAL DRUM	WASTE OIL
31244	H/SHP, AUTOMOTIVE	69	0	275 GAL	UNKNOWN-POSSIBLY EMPTY
31244	H/SHP, AUTOMOTIVE	573	-9	500 GAL	WASTE OIL
31244	H/SHP, AUTOMOTIVE	70	-9	550 GAL	WASTE OIL

TABLE 3.53

UNDERGROUND STORAGE TANKS

Outfall Area 12

BUILDING #	BUILDING DESCRIPTION	TANK #	STATUS	DATE REMOVED	TO BE REMOVED	YEAR INSTALLED	CONTENTS	VOLUME	REPLACEMENT
30060	VEH MAINT SHOP	281	ACTIVE		12/94	1964	DIESEL	20000	20000
30060	VEH MAINT SHOP	282	ACTIVE		12/94	1964	MUP	20000	20000
30167	ELEC PWR STN BLDG	417	REMOVED			-9	REMOVED	-9	
30182	WTR PMP STN	424	REMOVED	03/92		1987	REMOVED	250	
30182	WTR PMP STN	39	REMOVED	12/87		1979	REMOVED	250	
30199	RECREATION CENTER	101	REMOVED	01/92		1992	DIESEL	1000	
30199	RECREATION CENTER	416	REMOVED	03/92		-9	REMOVED	500	
30238	GOLF CLUBHSE/EQUIP	236	REMOVED	08/90		1961	REMOVED	1000	
30884	LAB, PME	269	ACTIVE			1978	#1 FUEL OIL	3000	
31011		105	ACTIVE			1980	FUEL OIL	1000	
31012		106	ACTIVE			1980	FUEL OIL	1000	
31015		107	ACTIVE			1980	FUEL OIL	1000	
31016		108	ACTIVE			1980	FUEL OIL	1000	
31017		109	ACTIVE			1980	FUEL OIL	1000	
31018		110	ACTIVE			1980	FUEL OIL	1000	
31083	THRIFT SHOP	331	REMOVED	09/88		1978	REMOVED	500	
31085	CORRECTION FACILITY	112	ACTIVE			1980	FUEL OIL	1000	
31229	BLDG WTR SUP	91	ACTIVE			1980	FUEL OIL	1000	
31240	HTG FCLTY BLDG	316	ACTIVE			1978	DIESEL	3000	
31240	HTG FCLTY BLDG	315	ACTIVE			1977	DIESEL	5000	
31240	HTG FCLTY BLDG	246	REMOVED	1992		1952	REMOVED	25000	
31244	H/SHP, AUTOMOTIVE	324	ACTIVE			1980	USED OIL/WASTE	500	

TABLE 3.54

COOLING TOWERS

Outfall Area 12

BUILDING #	BUILDING DESCRIPTION	MAX BLOWDOWN (GAL/DAY)	DISCHARGE 1987	DISCHARGE 1993	SERVICE	COMMENTS
30002	WHSE SUP & EQUIP BSE	2250	SAN		ABW	
30070	MWR SUP/NAF C-STOR	2880	SAN		ABW	
30884	LAB, PME	2340	SAN		ABW	
31250	STORE, COMMISSARY	1890	SAN		ABW	
31250	STORE, COMMISSARY	3330	SAN		ABW	

TABLE 3.55

HAZARDOUS WASTE GENERATORS

Outfall Area 12

BUILDING #	BUILDING DESCRIPTION	PERMIT #	ORGANIZATION	PHONE	ROOM NO.
30070	MWR SUP/NAF C-STOR	CS-016	AFMC/LGTP	74519	ANNEX
30174	MATERIAL SERVICES	CA-014	MED CENTER	76398	FIRE VAULT
30884	LAB, PME	CS-007	TW/MAOL	76972	CLEANING ROOM
30901	VEH MAINT SHOP	CS-010	LOG/DMTV	73578	
31244	H/SHP, AUTOMOTIVE	CA-017	ABW/MWRA	74937	

Outfall Area 13

This area includes a number of facilities directly related to flight support operations at the Base. These facilities are classified under paragraph viii - Airport Operations. Other facilities include materials handling/warehousing (paragraph xi, SIC 4225) and heating plant (paragraph vii). These operations are summarized on Table 3.56. Potential storm water impacts include outdoor aircraft maintenance operations, floor drains discharging to storm drainage (30013, 30170), storm water runoff into a building (or into oil/water separators (30013, 30256) material storage structural deficiencies (30170, and 30256). Facilities and operations in Buildings 30046, 30048, 30072, 30103, 30105, 30106, 30109, 30145, and 30268 appear to be conducted in a manner which minimizes the potential for contamination of storm water. Some of these facilities have been extensively renovated in the past few years.

The heating plant at 30170 no longer burns coal for steam generation. The plant collects condensate for return to the heating plant at 31240. Low grade steam flashed from the condensate in 30170 is used for building heat. The IRP report for this facility reports that spent acid from the ion exchange process used for boiler feedwater treatment is neutralized with soda ash and eventually drained into a storm sewer. Inspection of the plant confirmed that floor drains and boiler blowdown also discharge to storm drains.

One inactive landfill site (LF-13) is located within Outfall Area 13. This site is under the administration of the IRP and is discussed in detail in Section 5. The site is currently covered and protected against infiltration of storm water.

The East Ramp area is the principal aircraft staging zone for this portion of the Base. Fueling operations, repairs, and some de-icing are conducted throughout the East Ramp area. Table 3.57 presents the three year history of spill incidents for Outfall Area 13. Note that this record includes spills occurring on that portion of the East Ramp which is located within Outfall Area 14. Six fuel spills of 20 gallons or more have been reported in this vicinity during the past three years. It would appear that all of these spills occurred in a manner which creates a potential for contamination of storm water.

Specific guidance regarding the quantity of spilled fuel which meets the storm water criteria for "significant" is not currently available. The cut-off value of 20 gallons was selected based on informal estimates from several sources. It is possible that subsequent guidance from the USEPA or the Ohio Environmental Protection Agency (OEPA) will result in a higher or lower figure. Records at WPAFB indicate an additional nine reported spills between one and 20 gallons, plus an unknown number of less than one gallon. Further discussion of aircraft refueling and spill control practices is presented in Section 5.

Tables 3.58 through 3.61 present supplementary information on oil/water separators, storage tanks and hazardous waste generation in Outfall Area 13. One

undocumented oil/water separator appears to be in use at 30013. Nine USTs are scheduled for removal or replacement during 1993/1994, including one at 30256. However, it is not clear if this applies to the abandoned UST referred to at 30256. Further discussion of outdoor maintenance operations, the UST remediation program, and de-icing operations are presented in Section 5.

TABLE 3.56

INVENTORY OF FACILITIES WITH POTENTIAL STORM WATER IMPACTS

Outfall Area 13

BUILDING #	DESCRIPTION/FUNCTION	INDUSTRIAL CLASSIFICATION	WASTEWATER DISCHARGE	OTHER[1] POTENTIAL IMPACTS	NON-STORM DISCHARGE OR CROSS-CONNECTION	COMMENTS
30013	JET ENG REPAIR; AIRCRAFT MAINTENANCE	4581 S.W. VIII.	YES	A,B,C,E	YES	FLOOR AT GROUND LEVEL, STORM WATER RUNOFF INTO BUILDING AT SEVERAL POINTS. NO WEATHER PROTECTION AT RECEIVING DOORS. POTENTIAL SOME FLOOR DRAINS TO STORM, SEVERAL SEALED UP.
30046 30048	BSE; HAZARD STORAGE (GAS CYLINDERS)	4225 S.W. XI.	NO	C	NO	STORAGE OF COMPRESSED GAS CYLINDERS
30072	BSE; HAZARD STORAGE	4225 S.W. XI.	NO	NONE	NO	FACILITY RECEIVES/DISTRIBUTES HAZARDOUS MATERIAL USED AT BASE. FLOOR DRAINS TO NEUTRALIZATION/CONTAINMENT CELLS.
30103	AVIONICS; ELECTRONIC SYSTEM MAINTENANCE	4581 S.W. VIII.	NO	NONE	NO	OPERATIONS ENCLOSED; MINIMAL WASTES.
30105 30106	CORROSION CONTROL; AIRCRAFT PAINTING	4581 S.W. VIII.	YES	B,E	NO	FULLY ENCLOSED, ALL DRAINS TO SANITARY.
30109	AERO; GROUND EQUIPMENT STORAGE	4581 S.W. VIII.	NO	B,C	NO	NEED FOR ADDITIONAL STORM DRAINS. NEW OIL/WATER SEPARATOR IN 1994.
30145	AIRCRAFT MAINTENANCE	4581 S.W. VIII.	NO	A,C	NO	ALL A/C MAINTENANCE ENCLOSED. FLOOR DRAINS TO SANITARY.
30170	HEATING PLANT	S.W VII.	YES	C	YES	FLOOR DRAINS, BOILER BLOWDOWN DISCHARGE TO STORM. ECAMP 1992 CITATION. NO CONTAINMENT FOR 3,000 GAL H_2SO_4 TANK; PROBABILITY THAT SPILL WOULD REACH STORM DRAINS.

TABLE 3.56 (Continued)

BUILDING #	DESCRIPTION/FUNCTION	INDUSTRIAL CLASSIFICATION	WASTEWATER DISCHARGE	OTHER[1] POTENTIAL IMPACTS	NON-STORM DISCHARGE OR CROSS-CONNECTION	COMMENTS
30206	ELECTRONICS & INSTRUMENT REPAIR; PARTS INSTALLATION	4581 S.W. VIII.	NO	E	YES	OPERATIONS ENCLOSED; MINIMAL WASTES. FLOOR DRAINS TO SANITARY APPARENTLY RECEIVING STORM WATER INFILTRATION.
30256	JET ENGINE TEST CELL	4581 S.W. VIII.	YES	B,C	YES	HISTORY OF PROBLEMS WITH OIL/WATER SEPARATORS (2); PROBABLE STORM WATER AND WASTEWATER DRAINAGE TO O/W'S; HISTORY OF OVERFLOWS. ABANDONED OIL PUMPS/TANKS IN BASEMENT, ABANDONED UST AT WEST OF BUILDING, VENT PIPE OPEN.
30268	AIRCRAFT MAINTENANCE AND FLIGHT SERVICES	4581 S.W. VIII.	NO	A,B	NO	OPERATIONS FULLY ENCLOSED. RECENT (1992/1993) RENOVATION INCLUDES FLOOR DRAINS TO OIL/WATER SEPARATOR TO SANITARY.

[1] SEE TABLE 3.2 FOR KEY.

TABLE 3.57

HAZARDOUS MATERIAL AND FUEL SPILL INCIDENTS

Outfall Area 13[1]

BUILDING #	DATE	REMARKS
EAST RAMP	08/18/91	20 GAL JP-4 VENTED; AT TAXIWAY (TW) 8; F-14.
EAST RAMP	01/18/92	20 GAL JP-4; STUCK VENT VALVE; AT TW 12; DC-10.
EAST RAMP	08/18/91	30 GAL JP-4; SPILLED; AT TW-12; F-14.
EAST RAMP	03/19/92	150 GAL JP-4; FUEL SPILL DURING GROUND EMERGENCY; AT RW-5; F-16.
30142	08/02/93	30 GAL; DIESEL FUEL SPILL.

[1]INCLUDES EAST RAMP FUEL SPILLS FOR OUTFALL AREA 13 AND 14 COMBINED.

TABLE 3.58

OIL/WATER SEPARATORS

Outfall Area 13

BUILDING #	BUILDING DESCRIPTION	UNIT #	SIZE(GALS)	DISCHARGE	REMARKS
30013	SHP JET ENG I/MNT	12	1100	SAN	CONTAIN SEWAGE
30013	TRANSPORTATION	N/A	--	SAN	UNDOCUMENTED
30052		34	750	SAN	
30106	SHP, WPN & RLSE SYS	9	1600	SAN	HAS OIL STORAGE TANK
30109	SHP A/SE STOR FCLTY	16	900	SAN	
30119	EXCH, SVC STN	24	700	SAN	
30142	BASE PERSONNEL, OFC	23	1600	SAN	
30169	OPS, SP	28	UNKNOWN		ABANDONED
30256	TST CELL	17	2050	SAN	
30268	A/C MAINTENANCE	51	1000	SAN	

TABLE 3.59

ABOVE GROUND STORAGE TANKS

Outfall Area 13

BUILDING #	BUILDING DESCRIPTION	TANK #	DATE INST.	CAPACITY	TANK CONTENTS
30013	SHP JET ENG I/MNT	28	1960	110 GAL	DYE REMOVER
30013	SHP JET ENG I/MNT	23	1991	55 GAL	DIESEL
30046	HAZARD STOR, BSE	111	-9	275 GAL	#1 DIESEL
30057	HAZARD STOR, BSE	17	1992	275 GAL	DIESEL
30110	DISASTER PREP	35	1992	50 GAL	DIESEL
30123	SHP SHLTR LCMTV	379	-9	55 GAL	WASTE OIL
30123	SHP SHLTR, LCMTV	378	-9	55 GAL	WASTE OIL
30142	BASE PERSONNEL, OFC	33	1991	1000 GAL	DIESEL
30145	HG MAINT	295	-9	600 GAL	JP-4 (RECLAIMED)
30145	HG MAINT	296	-9	750 GAL	WASTE OIL
30163	FR STN	82	-9	55 GAL DR	WASTE OIL
30168	SP OPERATIONS	39	1989	05 GAL	DIESEL
30170	HTG FCLTY BLDG	37	1992	1000 GAL	DIESEL
30170	HTG FCLTY BLDG	312	1971	3000 GAL	SULFURIC ACID
30172	WTR PMP STN	142	1992	6 TONS	LIQUID CARBON DIOXIDE
30256	TST CELL	308	-9	4 TONS	EMPTY
30256	TST CELL	307	-9	650 GAL	JP-4

TABLE 3.60

UNDERGROUND STORAGE TANKS

Outfall Area 13

BUILDING #	BUILDING DESCRIPTION	TANK #	STATUS	DATE REMOVED	TO BE REMOVED	YEAR INSTALLED	CONTENTS	VOLUME	REPLACEMENT
30013	SHP JET ENG I/MNT	318	ACTIVE			1979	WASTE OIL/FUEL	10000	
30013	SHP JET ENG I/MNT	313	REMOVED	06/92		1961	WASTE OIL (1973)	500	
30092		216	REMOVED	12/91		1944	REMOVED	12000	
30092		219	REMOVED	12/91		1944	REMOVED	12000	
30092		217	REMOVED	12/91		1944	REMOVED	12000	
30092		218	REMOVED	12/91		1944	REMOVED	12000	
30092		220	REMOVED	12/91		1944	REMOVED	12000	
30109	SHP A/SE STOR FCLTY	288	ACTIVE			1981	DIESEL	1000	
30109	SHP A/SE STOR FCLTY	289	ACTIVE			1980	JP-4	1000	
30109	SHP A/SE STOR FCLTY	287	ACTIVE			1981	MOGAS UNLEADED	1000	
30119	EXCH, SVC STN	57	ACTIVE		12/94	1957	WASTE OIL	500	500 G UST
30119	EXCH, SVC STN	303	ACTIVE/NIS		03/93	1958	MOGAS UNLEADED	5000	
30119	EXCH, SVC STN	304	ACTIVE/NIS		03/93	1958	MOGAS UNLEADED	5000	
30119	EXCH, SVC STN	306	ACTIVE		03/93	1958	MOGAS UNLEADED	10000	
30119	EXCH, SVC STN	305	ABANDONED		03/93	1958	MOGAS UNLEADED	10000	
30141	ELEC PWR STN BLDG	280	ACTIVE		12/94	1960	DIESEL	1200	
30142	BASE PERSONNEL, OFC	92	REMOVED	01/92		-9		-9	
30142	BASE PERSONNEL, OFC	290	REMOVED	01/92		-9	REMOVED	800	
30149	ELEC PWR STN BLDG	32	ACTIVE			1980	DIESEL	2000	
30161	SHLTR, WEA INSTM	31	ACTIVE		12/94	1954	DIESEL	275	

TABLE 3.60 (Continued)

BUILDING #	BUILDING DESCRIPTION	TANK #	STATUS	DATE REMOVED	TO BE REMOVED	YEAR INSTALLED	CONTENTS	VOLUME	REPLACEMENT
30162	EXCH, RETAIL WHSE	234	ABANDONED			-9	NOT FOUND	6000	
30162	EXCH, RETAIL WHSE	233	ABANDONED			-9	NOT FOUND	6000	
30162	EXCH, RETAIL WHSE	232	ABANDONED			-9	NOT FOUND	6000	
30168	SP OPERATIONS	383	ACTIVE			1989	DIESEL	1000	
30168	SP OPERATIONS	53	REMOVED	07/91		-9	REMOVED	100	
30181	WTR PMP STN	50	REMOVED	07/91		1961	REMOVED	55	
30206	HG MAINT	277	REMOVED	01/92		1956	REMOVED	720	
30209	EXCH, BRANCH	229	REMOVED	08/89		-9	REMOVED 8-30-89	12000	
30209	EXCH, BRANCH	230	REMOVED	08/89		-9	REMOVED 8-30-89	12000	
30209	EXCH, BRANCH	231	REMOVED	08/89		-9	REMOVED 8-30-89	25000	
30238	GOLF CLUBHSE/EQUIP	236	ABANDONED		12/94	1961		1000	NONE
30256	TST CELL	314	ACTIVE		12/94	1959	WASTE OIL	1200	

TABLE 3.61

HAZARDOUS WASTE GENERATORS

Outfall Area 13

BUILDING #	BUILDING DESCRIPTION	PERMIT #	ORGANIZATION	PHONE	ROOM NO.
30013	SHP JET ENG I/MNT	CA-006	TW/MAOES	72124	CORROSION CONTR
30013	SHP JET ENG I/MNT	CS-008	TW/MAOCE	73883	BATTERY SHOP
30089	WHSE SUP & EQUIP BSE	CA-024	ABW/EMC	77152	HIGH BAY
30105	ACFT COR CON	CS-005	906 MAOES	74023	STOCK ROOM
30206	MG MAINT	CS-022	TW/AMIS	79745	303
30206	HG MAINT	CS-023	TW/AM	73930	N. HANGAR TOOL C

Outfall Areas 14, 15 and 16

These areas encompass portions of the East Ramp and approximately the western two thirds of the main runway and taxiway network. Five industrial facilities are located within Outfall Area 14. No buildings are located within Outfall Areas 15 and 16, but runway de-icing operations qualify these areas for industrial classification. There is one inactive disposal site administered by the IRP located in Outfall Area 16.

Table 3.62 presents a summary of potential storm water impacts associated with facilities in Outfall Area 14. All five of these facilities have undergone extensive renovations since 1989 and currently present minimal potential impacts to storm water. All maintenance operations are enclosed and no aircraft de-icing is applied to the F-16's which are currently based here. Spillage from airway refueling practices discussed under Outfall Area 13 is also applicable to this area.

Supplementary information is presented in Tables 3.63 through 3.69. Note that fuel spills which may have occurred in Outfall Area 14 were previously reported on Table 3.57. Also, one of the hazardous waste collection/storage points for Building 30093 is described as outside. At least two of the recently installed oil/water separators have yet to be documented or registered by CE.

TABLE 3.62

INVENTORY OF FACILITIES WITH POTENTIAL STORM WATER IMPACTS

Outfall Area 14

BUILDING #	DESCRIPTION/FUNCTION	INDUSTRIAL CLASSIFICATION	WASTEWATER DISCHARGE	OTHER POTENTIAL IMPACTS[1]	NON-STORM DISCHARGE OR CROSS-CONNECTION	COMMENTS
30091	FUEL SYSTEM MAINTENANCE - F-16	4581 S.W. VIII.	NO	A,C	NO	ALL OPERATIONS ENCLOSED. UNDOCUMENTED OIL/WATER SEPARATOR AT THIS LOCATION, DRAINS TO SANITARY.
30093	GROUND EQUIPMENT	4581 S.W. VIII.	YES	C,E	NO	ALL OPERATIONS ENCLOSED.
30101	GENERAL MAINTENANCE/REPAIR - F-16	4581 S.W. VIII.	YES	NONE	NO	ALL OPERATIONS ENCLOSED. FLOOR DRAINS TO OIL/WATER SEPARATOR TO SANITARY, SEPARATOR IS UNDOCUMENTED.
30144	HUSH HOUSE - JET ENG TEST CELL	4581 S.W. VIII.	YES	B,C	NO	ALL FLOOR DRAINS TO OIL/WATER SEPARATOR TO SANITARY.
30148	A/C MAINT & FLIGHT SERVICE	4581 S.W. VIII.	NO	B	NO	OPERATIONS FULLY ENCLOSED. RECENT (1992/1993) RENOVATION INCLUDES FLOOR DRAIN TO OIL/WATER SEPARATOR TO SANITARY.

[1]SEE TABLE 3.2 FOR KEY.

TABLE 3.63

HAZARDOUS MATERIAL AND FUEL SPILL INCIDENTS

Outfall Area 14[1]

[1]SEE TABLE 3.57 FOR GENERAL REPORTING OF EAST RAMP FUEL SPILLS.

TABLE 3.64

OIL/WATER SEPARATORS

Outfall Area 14

BUILDING #	BUILDING DESCRIPTION	UNIT #	SIZE(GALS)	DISCHARGE	REMARKS
30144	PAD, PWR CHK W/SPR	46	750	SAN	
30093	GROUND EQUIPMENT	47	500	SAN	
30148	A/C MAINTENANCE	50	1000	SAN	
30091	FUEL SYSTEM MAINTENANCE	--	--	SAN	UNDOCUMENTED
30101	ENGINE MAINTENANCE	--	--	SAN	UNDOCUMENTED

TABLE 3.65

ABOVE GROUND STORAGE TANKS

Outfall Area 14

BUILDING #	BUILDING DESCRIPTION	TANK #	DATE INST.	CAPACITY	TANK CONTENTS
30093	SHP A/SE STOR FCLTY	94	-9	500 GAL	WASTE OIL
30094		83	-9	55 GAL DR	WASTE OIL
30144	PAD, PWR CHK W/SPR	297	-9	2500 GAL	JP-4
30148	SHP A/M ORGL	86	-9	55 GAL DR	WASTE HYDRAULIC FLUID
30148	SHP A/M ORGL	85	-9	55 GAL DR	WASTE HYDRAULIC FLUID

TABLE 3.66

UNDERGROUND STORAGE TANKS

Outfall Area 14

BUILDING #	BUILDING DESCRIPTION	TANK #	STATUS	DATE REMOVED	TO BE REMOVED	YEAR INSTALLED	CONTENTS	VOLUME
30091	MAINT DOCK, FL SYS	440	ACTIVE			1986	DETERGENT	550
30091	MAINT DOCK, FL SYS	413	ACTIVE			1985	WASTE FUEL/OIL	550
30093	SHP A/SE STOR FCLTY	376	ACTIVE			1989	MUP	2500
30093	SHP A/SE STOR FCLTY	377	ACTIVE			1989	JP-4	2500
30093	SHP A/SE STOR FCLTY	378	ACTIVE			1989	DIESEL	1000
30094		58	ACTIVE			1986	WASTE FUEL	2000
30136	SHP A/SE STOR FCLT	379	ACTIVE			1989	WASTE HYDRAZINE	1000

TABLE 3.67

HAZARDOUS WASTE GENERATORS

Outfall Area 14

BUILDING #	BUILDING DESCRIPTION	PERMIT #	ORGANIZATION	PHONE	ROOM NO.
30093	SHP A/SE STOR FCLTY	CS-002	906 MAEBC	77747	12
30093	SHP A/SE STOR FCLTY	CA-003	906 MAEBC	77747	OUTSIDE
30093	SHP A/SE STOR FCLTY	CS-001	906 MAEA	73773	9

TABLE 3.68

ABOVE GROUND STORAGE TANKS

Outfall Area 15

BUILDING #	BUILDING DESCRIPTION	TANK #	DATE INST.	CAPACITY	TANK CONTENTS
30967	ELEC PWR STN BLDG	60	1982	275 GAL	DIESEL

TABLE 3.69

UNDERGROUND STORAGE TANKS

Outfall Area 15

BUILDING #	BUILDING DESCRIPTION	TANK #	STATUS	DATE REMOVED	TO BE REMOVED	YEAR INSTALLED	CONTENTS	VOLUME
30950	VORTAC, FIXED	114	ACTIVE			1986	DIESEL	550

Outfall Area 17

Outfall Area 17 includes several industrial facilities, the primary petroleum, oil and lubricant (POL) storage facility, and runway de-icing operations. Surface discharge from this area is monitored under the current NPDES permit. Several sites within this area are administered by the IRP, but none of them meet the criteria for industrial storm water classification as landfills or land disposal sites.

Industrial and other facilities with potential storm water impacts are summarized on Table 3.70. Potential impacts include floor drain discharges to storm drainage (30017), structural Hazmat storage deficiencies (30020), swimming pool drainage practices, drainage from aircraft washing (30153), and disposal of infiltration water from fuel storage tanks (30154).

Three fuel spills of 20 gallons or more have occurred in Outfall Area 17 in the past three years. Spills at the tank farm occurring within containment areas may not have resulted in potential exposure to storm water. Spill information is summarized in Table 3.71.

Surface water discharges from Outfall Area 17 are monitored if water is present at the time of sampling. The sampling point is identified as NPDES Outfall 005 and is monitored for TSS, pH, and temperature. The outfall is often dry and only occasionally exceeds the limits for TSS.

Supplementary information is presented in Tables 3.72 through 3.75. Note that 19 USTs are scheduled for removal during 1993/1994. The description of a collection/storage point for hazardous wastes at 30022 may be an outside location.

TABLE 3.70

INVENTORY OF FACILITIES WITH POTENTIAL STORM WATER IMPACTS

Outfall Area 17

BUILDING #	DESCRIPTION/FUNCTION	INDUSTRIAL CLASSIFICATION	WASTEWATER DISCHARGE	OTHER[1] POTENTIAL IMPACTS	NON-STORM DISCHARGE OR CROSS-CONNECTION	COMMENTS
30017	BE MAINTENANCE - PWER PRODUCTION	4581 S.W. VIII.	YES	C	YES	DRAINS IN AND ADJACENT TO 30017 DISCHARGES TO STORM. SOME DRAINS PLUGGED. WORK ORDER (85178) TO INSTALL OIL/WATER SEPARATOR. ALSO, DE-ICING OF AIRCRAFT BARRIER ARRESTING EQUIPMENT DISCHARGES TO STORM.
30020	BE STORAGE; HAZARDOUS MATERIALS	4581 S.W. VIII.	NO	NONE	NO	ECAMP 1992 CITATION; HAZMAT STORAGE DEFICIENCIES; NOT CORRECTED AS OF JANUARY 1994.
30022	BE MAINTENANCE - WATER, SEWER, GAS	4581 S.W. VIII.	YES	A,E	YES	SWIMMING POOLS, ANNUAL DRAINING DISCHARGED TO STORM.
30151	MAINTENANCE, A/C REFUELING VEHICLES	4581 S.W. VIII.	NO	B,C	NO	OUTSIDE MAINTENANCE/VEHICLE STORAGE AND ALL INSIDE FLOOR DRAINS TO OIL/WATER SEPARATOR TO SANITARY.
30152	HG MAINTENANCE - SPECIAL PROJECTS	4581 S.W. VIII.	NO	C	NO	OPERATION FULLY ENCLOSED -
30153	AERO CLUB	7997	NO	C,E	YES	A/C WASHING TO SURFACE OR STORM DRAINS.
30154	FUEL OPERATIONS BUILDING	4581 S.W. VIII.	NO	A,B,C	YES	INFILTRATION WATER FROM TANKS DRAINS TO OIL/WATER SEPARATOR TO STORM. PROJECT IN 1994 TO CONVERT THIS TO SANITARY DISCHARGE.

[1]SEE TABLE 3.2 FOR KEY.

TABLE 3.71

HAZARDOUS MATERIAL AND FUEL SPILL

Outfall Area 17

BUILDING #	DATE	REMARKS
30154	4/23/92	JP-4; FUEL LEAK IN PIT; APPROX. 30 GAL.
AIRFIELD G-9	2/26/93	TANKER W/BLOWN SEAL LEAKED APPROX. 20 GAL. JP-4
30154	4/22/93	JET FUEL LEAK; APPROX. 30 GAL.

TABLE 3.72

OIL/WATER SEPARATORS

Outfall Area 17

BUILDING #	BUILDING DESCRIPTION	UNIT #	SIZE(GALS)	DISCHARGE	REMARKS
30143	TRML, AIR FRT	43	800	SAN	
30151	SHP, REFL VEH	45	475	SAN	HAS OIL STORAGE TANK
37XXX	POL TANK FARM, AREA C	2	1300	STORM	
37XXX	POL TANK FARM, AREA C	1	1600	STORM	

TABLE 3.73

ABOVE GROUND STORAGE TANKS

Outfall Area 17

BUILDING #	BUILDING DESCRIPTION	TANK #	DATE INST.	CAPACITY	TANK CONTENTS
30017	BE MAINT SHP	147	-9	160 GAL	DIESEL
30017	BE MAINT SHP	89	-9	300 GAL	WASTE OIL
30023	BE STOR CV FCLTY	104	-9	275 GAL	UNKNOWN
30049		103	-9	55 GAL DR	WASTE JET FUEL
30151	SHP, REFL VEH	87	-9	250 GAL	WASTE MOTOR OIL
30153	CLUB, AREO	88	-9	335 GAL	WASTE OIL
30154	PETROL OPS BLDG	250	1953	420000 GAL	JP-4
30154	PETROL OPS BLDG	251	1953	420000 GAL	JP-4
30154	PETROL OPS BLDG	254	1953	420000 GAL	JP-4
30154	PETROL OPS BLDG	249	1953	420000 GAL	JP-4
31054	PETROL OPS BLDG	253	1953	420000 GAL	AVGAS
30154	PETROL OPS BLDG	257	1953	420000 GAL	JP-4 JET FUEL
30154	PETROL OPS BLDG	271	160	840000 GAL	JP-4
30154	PETROL OPS BLDG	256	1953	420000 GAL	JP-4 JET FUEL
30154	PETROL OPS BLDG	310	1968	15000 GAL	MOGAS
30154	PETROL OPS BLDG	78	-9	55 GAL DR	WASTE DIESEL FUEL
30154	PETROL OPS BLDG	105	-9	275 GAL	WASTE JP-4
31054	PETROL OPS BLDG	63	-9	275 GAL	DIESEL
30154	PETROL OPS BLDG	272	1959	212000 GAL	#2 DIESEL
30154	PETROL OPS BLDG	258	1953	420000 GAL	JP-4 JET FUEL

TABLE 3.73 (Continued)

BUILDING #	BUILDING DESCRIPTION	TANK #	DATE INST.	CAPACITY	TANK CONTENTS
30154	PETROL OPS BLDG	252	1953	420000 GAL	JP-4
30154	PETROL OPS BLDG	77	-9	55 GAL DR	WASTE DIESEL FUEL
30155	AUTO SWITCHING CEN	99	-9	55 GAL DR	WASTE DIESEL FUEL
30155	AUTO SWITCHING CEN	95	-9	55 GAL DR	WASTE JET FUEL
30155	AUTO SWITCHING CEN	98	-9	55 GAL DR	WASTE JET FUEL
30155	AUTO SWITCHING CEN	100	-9	55 GAL DR	WASTE JET FUEL
30155	AUTO SWITCHING CEN	96	-9	55 GAL DR	WASTE JET FUEL
30155	AUTO SWITCHING CEN	97	-9	55 GAL DR	WASTE JET FUEL
30256	TST CELL	308	-9	4 TONS	EMPTY
30256	TST CELL	307	-9	650 GAL	JP-4

TABLE 3.74

UNDERGROUND STORAGE TANKS

Outfall Area 17

BUILDING #	BUILDING DESCRIPTION	TANK #	STATUS	DATE REMOVED	TO BE REMOVED	YEAR INSTALLED	CONTENTS	VOLUME	REPLACEMENT
30018	ELEC PWR STN BLDG	30	REMOVED	04/92		1962	REMOVED	500	
30018	ELEC PWR STN BLDG	102	ACTIVE/NIS			1992	DIESEL	550	
30049A		200	ABANDONED		10/93	1950	SAND	25000	NONE
30049A		201	ABANDONED		10/93	1950	SAND	25000	NONE
30049A		202	ABANDONED		10/93	1950	SAND	25000	NONE
30049A		203	ABANDONED		10/93	1950	SAND	25000	NONE
30049A		204	ABANDONED		10/93	1950	SAND	25000	NONE
30049A		205	ABANDONED		10/93	1950	SAND	10000	NONE
30049A		206	ABANDONED		10/93	1950	SAND	25000	NONE
30049A		207	ABANDONED		10/93	1950	SAND	25000	NONE
30049A		208	ACTIVE		10/93	1950	JP-4	25000	NONE
30049A		209	ACTIVE		10/93	1950	JP-4	25000	NONE
30049A		210	ACTIVE/NIS		10/93	1944	DE-ICING FLUID	25000	25,000 G UST AT 30154
30049A		211	ACTIVE		10/93	1944	DE-ICING FLUID	25000	25,000 G UST AT 30154
30049A		212	ACTIVE		10/93	1944	JP-5	25000	NONE
30049A		213	ACTIVE/NIS		10/93	1944	JP-5	25000	NONE
30049A		214	ACTIVE		10/93	1944	SOLVENT	12000	NONE
30049A		215	ABANDONED		10/93	1950	SAND	10000	NONE

TABLE 3.74 (Continued)

BUILDING #	BUILDING DESCRIPTION	TANK #	STATUS	DATE REMOVED	TO BE REMOVED	YEAR INSTALLED	CONTENTS	VOLUME	REPLACEMENT
30143	TRML, AIR FRT	24	ACTIVE			1986	DIESEL	5000	
30149	ELEC PWR STN BLDG	32	ACTIVE			1980	DIESEL	2000	
30151	SHP, REFL VEH	54	ACTIVE			1984	USED PETROLEUM	6000	
30152	HG MAINT	279	REMOVED	01/92		1956	REMOVED	1000	
30153	CLUB, AREO	327	REMOVED	07/91		-9	REMOVED	3000	
30153	CLUB, AREO	301	REMOVED	10/87		1972	REMOVED	2000	
30153	CLUB, AREO	150	ACTIVE			1987	AVGAS	12000	
30153	CLUB, AREO	295	REMOVED	08/91		1966	REMOVED	3000	
30153	CLUB, AREO	302	REMOVED	10/87		1972	REMOVED	1000	
30154	PETROL OPS BLDG	311	ACTIVE		12/93	1976	WASTE FUEL	3000	
30159	HYDR FL, BLDG	85	ACTIVE			1985	WASTE FUEL	2000	
30256	TST CELL	314	ACTIVE		12/94	1959	WASTE OIL	1200	
30973		33	ACTIVE		06/93	1977	MOGAS	75	

TABLE 3.75

HAZARDOUS WASTE GENERATORS

Outfall Area 17

BUILDING #	BUILDING DESCRIPTION	PERMIT #	ORGANIZATION	PHONE	ROOM NO.
30022	BE MAINT SHP	CS-012	CES/DEMGUP	76266	SPRAY SHOP
30022	BE MAINT SHP	CA-020	CES/DEMSZ	73904	FENCED AREA
30153	CLUB, AREO	CS-019	645 MWYA	77714	

Outfall Area 18

This area consists of the West Ramp aircraft staging zone where aircraft refueling and de-icing operations are conducted. No buildings are located within this area, but the above operations qualify the area for industrial classification under paragraph viii - Airport Operations. No IRP administered disposal sites are located within the area.

Operational impacts which create potential sources of storm water contamination are reflected in the three-year history of spills for Outfall Area 18. These are summarized on Table 3.76. During the past three years, five fuel spills of 20 gallons or more have been reported for this area. An additional five spills of one to 20 gallons were also reported during this time period.

One oil/water separator with a capacity of 14,400 gallons serves the West Ramp area. This unit (Table 3.77) receives only storm water and discharges to the storm sewer system.

TABLE 3.76

HAZARDOUS MATERIAL AND FUEL SPILL INCIDENTS

Outfall Area 18

BUILDING #	DATE	REMARKS
WEST RAMP	10/01/92	50 GAL JP-4: SPILLED, RUPTURED HOSE; AT ABLE 3; C-18
WEST RAMP	12/17/93	35 GAL JP-4; A/C LEAKING FUEL; AT ABLE 7; C-141
WEST RAMP	03/03/93	30 GAL JP-4; STUCK VENT VALVE; AT ABLE 9; C-135
WEST RAMP	05/10/93	20 GAL JP-4; SPILL, MALFUNCTION; AT ABLE 10; C-141
WEST RAMP	08/09/93	25 GAL; POWER UNIT LEAKING DIESEL FUEL; AT ABLE 12

TABLE 3.77

OIL/WATER SEPARATORS

Outfall Area 18

BUILDING #	BUILDING DESCRIPTION	UNIT #	SIZE(GALS)	DISCHARGE	REMARKS
34XXX	TAXIWAY, WEST RAMP	3	6 EA 2400 TOTAL = 14400	STORM	CONTINUOUSLY RUNNING

Outfall Area 19

Outfall Area 19 contains five facilities which support flight operations on the West Ramp and which qualify as industrial facilities under paragraph viii. These facilities are summarized on Table 3.78. These facilities are all relatively new, exhibit excellent housekeeping standards, accommodate fully enclosed maintenance operations, and present minimal potential for contamination of storm water runoff.

No hazardous material or fuel spill incidents of more than 20 gallons have been reported from this area in the past three years. Only one spill of less than 20 gallons is on record. This was a one gallon leak of gasoline from ground power equipment.

Supplementary information for this area is presented in Tables 3.79 through 3.82. Note that 10 of 15 USTs currently in service in this area are scheduled for removal or replacement during 1994.

TABLE 3.78

INVENTORY OF FACILITIES WITH POTENTIAL STORM WATER IMPACTS

Outfall Area 19

BUILDING #	DESCRIPTION/FUNCTION	INDUSTRIAL CLASSIFICATION	WASTEWATER DISCHARGE	OTHER[1] POTENTIAL IMPACTS	NON-STORM DISCHARGE OR CROSS-CONNECTION	COMMENTS
34021	AERO GROUND SUPPORT EQUIPMENT	4581 S.W. VIII.	YES	B,C,E	NO	FLOOR DRAINS TO OIL/WATER SEPARATOR TO SANITARY. FULLY ENCLOSED OPERATIONS.
34022	INSPECTION DOCK	4581 S.W. VIII.	NO	B,E	NO	ALL DRAINAGE TO SANITARY. MINIMAL WASTE STREAM. FULLY ENCLOSED.
34028	AIRCRAFT MAINTENANCE	4581 S.W. VIII.	NO	A,C	NO	FULLY ENCLOSED, SHARES OIL/WATER SEPARATOR WITH 34022.
34030 34032	PMP STU, LF-FUEL FARM	4581 S.W. VIII.	NO	B,C	NO	FULLY ENCLOSED. FLOOR DRAINS TO CONTAINMENT TANKS.
34033	PETROL OPS BUILDING	4581 S.W. VIII.	NO	B	NO	OIL/WATER SEPARATOR DISCHARGE TO STORM, RECEIVES STORM WATER ONLY.

[1] SEE TABLE 3.2 FOR KEY.

TABLE 3.79

OIL/WATER SEPARATORS

Outfall Area 19

BUILDING #	BUILDING DESCRIPTION	UNIT #	SIZE(GALS)	DISCHARGE	REMARKS
34021	AERO GROUND EQUIP	49	1000	SAN	
34022	MAINT DOCK, L/A	6	2700	SAN	
34030	PMP STN, LF	7	1500	STORM	REPORTED NOT IN SERVICE.
34033	PETROL OPS BLDG	48	1000	STORM	RECEIVES STORM WATER RUNOFF ONLY.

TABLE 3.80

ABOVE GROUND STORAGE TANKS

Outfall Area 19

BUILDING #	BUILDING DESCRIPTION	TANK #	DATE INST.	CAPACITY	TANK CONTENTS
34028	MAINT DOCK, L/A	106	-9	600 GAL	WASTE OIL
34030	PMP STN, LF	108	-9	200 GAL	WASTE PETROLEUM LIQUIDS
34030	PMP STN, LF	109	-9	55 GAL DR	WASTE JP-4
34030	PMP STN, LF	107	-9	90 GAL	WASTE PETROLEUM-MIXED
34030	PMP STN, LF	110	-9	55 GAL DR	WASTE JP-4

TABLE 3.81

UNDERGROUND STORAGE TANKS

Outfall Area 19

BUILDING #	BUILDING DESCRIPTION	TANK #	STATUS	DATE REMOVED	TO BE REMOVED	YEAR INSTALLED	CONTENTS	VOLUME	REPLACEMENT
34021	SHP A/SE STOR FCLTY	371	ACTIVE			1989	MOGAS	1000	
34021	SHP A/SE STOR FCLTY	374	ACTIVE			1989	WASTE OIL	550	
34021	SHP A/SE STOR FCLTY	372	ACTIVE			1989	DIESEL	1000	
34021	SHP A/SE STOR FCLTY	373	ACTIVE			1989	JP-4	1000	
34029	ELEC PWR STN BLDG	38	ACTIVE		12/94	1960	DIESEL	275	
34030	PMP STN, LF	274	ACTIVE		12/94	1960	JP-4	50000	50,000 G UST*
34030	PMP STN, LF	276	ACTIVE		12/94	1960	JP-4	50000	50,000 G UST*
34030	PMP STN, LF	307	ACTIVE		12/92	1960	WASTE FUEL	2000	2,000 G UST*
34030	PMP STN, LF	275	ACTIVE		12/94	1960	JP-4	50000	50,000 G UST*
34030	PMP STN, LF	273	ACTIVE		12/94	1960	JP-4	50000	50,000 G UST*
34032	HYDR FL, BLDG	284	ACTIVE		12/94	1965	JP-4	50000	50,000 G UST*
34032	HYDR FL, BLDG	308	ACTIVE		12/94	1965	WASTE FUEL	2000	2,000 G UST*
34032	HYDR FL, BLDG	285	ACTIVE		12/94	1965	JP-4	50000	50,000 G UST*
34032	HYDR FL, BLDG	286	ACTIVE		12/94	1965	JP-4	50000	50,000 G UST*
34032	HYDR FL, BLDG	283	ACTIVE		12/94	1965	JP-4	50000	50,000 G UST*

TABLE 3.82

HAZARDOUS WASTE GENERATORS

Outfall Area 19

BUILDING #	BUILDING DESCRIPTION	PERMIT #	ORGANIZATION	PHONE	ROOM NO.
34021	SHP A/SE STOR FCLTY	CS-009	TW/MAOSG	74538	3
34022	MAINT DOCK, L/A	CS-018	TW/MAOSL	72116	CONEX 1

Outfall Area 20

Four facilities subject to industrial classification are located within this drainage area. Potential sources of storm water contamination are minimal due to construction characteristics of the facilities and operational standards of the tenant organizations. These are summarized in Table 3.83.

No IRP disposal sites are located within this area and no hazardous material or fuel spill incidents have been reported during the past three years. Supplemental information about oil/water separators, storage tanks, and cooling towers is presented in Tables 3.83 through 3.87. No problem areas are indicated by this information.

TABLE 3.83

INVENTORY OF FACILITIES WITH POTENTIAL STORM WATER IMPACTS

Outfall Area 20

BUILDING #	DESCRIPTION/FUNCTION	INDUSTRIAL CLASSIFICATION	WASTEWATER DISCHARGE	OTHER[1] POTENTIAL IMPACTS	NON-STORM DISCHARGE OR CROSS-CONNECTION	COMMENTS
34012	AVIONICS - GUIDANCE AND COMMUNICATIONS	4581 S.W. VIII.	NO	C	NO	ALL OPERATIONS ENCLOSED, MINIMAL WASTE STREAM.
34020	FUEL SYSTEMS MAINTENANCE	4581 S.W. VIII.	NO	B,C	NO	ALL OPERATIONS ENCLOSED. FLOOR WASHING TO OIL/WATER SEPARATORS (2) TO SAN.
34024	AIRCRAFT WASHING - CORROSION CONTROL	4581 S.W. VIII.	YES	B,C	NO	WASHING EFFLUENT TO OIL/WATER SEPARATOR TO SANITARY.
34026 34032	AIRCRAFT MAINTENANCE DOCK	4581 S.W VIII.	NO	B	NO	MAINTENANCE/REPAIR OPERATIONS FULLY ENCLOSED.

[1]SEE TABLE 3.2 FOR KEY.

TABLE 3.84

OIL/WATER SEPARATORS

Outfall Area 20

BUILDING #	BUILDING DESCRIPTION	UNIT #	SIZE(GALS)	DISCHARGE	REMARKS
34020	MAINT DOCK, FL SYS	8B	150	SAN	HAS OIL STORAGE
34020	MAINT DOCK, FL SYS	8A	150	SAN	HAS OIL STORAGE TANK
34024	ACFT COR CON	25	6500	SAN	
34026	MAINT DOCK, L/A	5	2700	SAN	

TABLE 3.85

ABOVE GROUND STORAGE TANKS

Outfall Area 20

BUILDING #	BUILDING DESCRIPTION	TANK #	DATE INST.	CAPACITY	TANK CONTENTS
34012	WPN SYS/M MGT FCLTY	116	-9	275 GAL	#1 DIESEL
34024	ACFT COR CON	6	1987	650 GAL	DIESEL
34024	ACFT COR CON	7	1983	1500 GAL	AQUEOUS FILM FORMING FOAM

TABLE 3.86

UNDERGROUND STORAGE TANKS

Outfall Area 20

BUILDING #	BUILDING DESCRIPTION	TANK #	STATUS	DATE REMOVED	TO BE REMOVED	YEAR INSTALLED	CONTENTS	VOLUME
34008	HQ WG	419	REMOVED	02/92		-9	REMOVED	-9
34010	HQ WG	36	REMOVED	02/92		1958	REMOVED	275
34010	HQ WG	388	ACTIVE			1990	DIESEL	550
34012	WPN SYS/M MGT FCLTY	37	ACTIVE		12/94	1968	DIESEL	275
34020	MAINT DOCK, FL SYS	334	REMOVED	12/86		1961	REMOVED	275
34020	MAINT DOCK, FL SYS	415	ACTIVE			1986	WASTE JP-4, PET	350
34020	MAINT DOCK, FL SYS	414	ACTIVE			1986	WASTE JP-4, PET	350
34020	MAINT DOCK, FL SYS	333	REMOVED	12/86		1961	REMOVED	275

TABLE 3.87

COOLING TOWERS

Outfall Area 20

BUILDING #	BUILDING DESCRIPTION	MAX BLOWDOWN (GAL/DAY)	DISCHARGE 1987	DISCHARGE 1993	SERVICE	COMMENTS
34010	HQ WG	1980	SAN		ABW	

Outfall Regions I, II, III, IV, V, VI, AND VII

The drainage regions, discussed individually in following paragraphs, convey surface runoff along diffuse overland paths to receiving surface waters. No facilities subject to industrial storm water classification are located in any of these regions. However, with the exception of Region II, inactive landfill or disposal sites are located in all of these regions. Such sites are subject to storm water industrial classification under paragraph v; landfills or land application sites that have received any industrial wastes. All of these sites are administered by IRP and are discussed in further detail in Section 5.

Outfall Region I

This a small, undeveloped parcel lying west of the old Wright Field runway. A portion of Operable Unit 6 (OU6) is located in this region, which consisted of a surface dump for general refuse operated from 1941 to 1955. This unit is designated as Landfill 2 (LF2).

Outfall Region II

This region includes Colonel Glenn Highway and the Page Manor housing subdivision lying southwest of Outfall Area 1. Land use includes family housing, shopping, and recreational facilities. There are no facilities or activities subject to industrial storm water classification within this region.

Outfall Region III

This is a narrow strip of mostly south facing slopes along the southern boundary of Outfall Area 1. Colonel Glenn Highway and the I-675 Connector accessing Gate 22B are the principal features of this region. Disposal sites within this area are part of OU9 and are designated burial site 3 (BS3) and earthfill disposal zone 10 (EFDZ10).

Outfall Region IV

Primarily undeveloped land lying west of Outfall Areas 6 and 7 and south of Hebble Creek encompass this region. The Prime Beef Training Area (CE) is located at the western end of this region. Other uses include golf course, horse stables and pastures, and a conservation area. Portions of OU4 (LF6, LF7) and OU5 (FTA1) are located in this region.

Outfall Region V

This region encompasses undeveloped land lying south and west of Outfall Area 14, south of Trout Creek and north of Hebble Creek. Features include the historic Wright Field (circa 1904), Huffman prairie and grassland, and three small lakes.

Facilities include the family camp area; archery, shotgun, and handgun ranges; and golf. Portions of OU5 (BS4 and LF5) are located in this region.

Outfall Region VI

This region consists of undeveloped land (runway set-aside) lying east of Outfall Area 17. Portions of this are wooded, others are leased for agriculture. Disposal sites within this region include OU7 (LF9) and a portion of OU2 (BS1).

Outfall Area VII

This region is bounded to the east by Outfall Areas 18, 19, and 20 and to the south by Outfall Area 17 and its drainage ditch. Several non-industrial facilities are located in this region, including administrative support of West Ramp operations, operation of electronic equipment, munitions management, and recreational facilities administered by MWR. A prominent feature in the region is Bass Lake (42 acres). Portions of OU11 located within this region include a former chemical disposal area and BS2. The current fire training area is located in this region (See discussion in Section 5).

Outfall Area VIII

This region lies generally west and north of Outfall Areas 14 and 16. It is bounded to the west by Trout Creek and to the east by the Outfall Area 17 drainage ditch. Past uses of the largely undeveloped area include ordnance disposal and hazardous waste storage. Portions of OU3 located within this region include LF11, LF12, LF14, closed fire training areas, and EFDZ11.

Other Facilities

Table 3.88 summarizes oil/water separators, hazardous waste generators, and storage tanks in use within Regions I through VIII. Included are two oil/water separators used by the fire training facilities which discharge to storm drainages.

TABLE 3.88

FACILITIES IN OTHER DRAINAGE REGIONS

Oil/Water Separators

REGION	BUILDING #	BUILDING DESCRIPTION	UNIT #	SIZE(GALS)	DISCHARGE
VII	34044	SHP A/SE STOR FCLTY	4	1200	SAN
VII	30XXX	FIRE TRAINING FAC	33	2000	STORM

Hazardous Waste Generators

REGION	BUILDING #	BUILDING DESCRIPTION	PERMIT #	ORGANIZATION	PHONE	ROOM NO.
VII	34067	STOR, RKT CHK ASMBB	CS-004	906 MAECC	77609	9-MAINT BAY

TABLE 3.88 (Continued)

Above Ground Storage Tanks

REGION	BUILDING #	BUILDING DESCRIPTION	TANK #	DATE INST.	CAPACITY	TANK CONTENTS
II	6000PM		380	-9	500 GAL	WASTE OIL
IV	10894		75	-9	300 GAL	DIESEL
IV	10894		72	-9	275 GAL	DIESEL
IV	10894		74	-9	300 GAL	REGULAR GAS
IV	10894		73	1992	275 GAL	DIESEL
IV	30300	BE STOR CV FCLTY	241	-9	5500 GAL	CALCIUM CHLORIDE
IV	30851	WTR PMP STN	36	-9	500 GAL	DIESEL
IV	30881	BE MAINT SHP	233	1982	5000 GAL	50% HYDROGEN PEROXIDE
IV	30886	RG, SM ARM SYS	206	1992	275 GAL	EMPTY
IV	30891	CLUB, ROD AND GUN	115	1974	275 GAL	DIESEL
IV	30892	CLUB, ROD AND GUN	114	1974	275 GAL	DIESEL
IV	30898	RIDING STABLES	120	-9	275 GAL	EMPTY
VII	30971	ELEC PWR STN BLDG	54	-9	275	DIESEL
VII	34041	TWR, CON	57	-9	500 GAL	PROPANE
VII	34047	STOR LIQ OXYGEN	10	-9	2000 GAL	LIQUID NITROGEN
VII	34047	STOR LIQ OXYGEN	11	1991	200 GAL	LIQUID NITROGEN
VII	34049		112	-9	55 GAL DR	WASTE OIL
VII	34051	STOR LIQ OXYGEN	9	-9	5000 GAL	LIQUID OXYGEN
VII	34051	STOR LIQ OXYGEN	8	-9	2000 GAL	LIQUID OXYGEN
VII	34053	SP KENNEL, CANINE	12	1977	275 GAL	DIESEL
VII	34090	FIREMAN TNG FCLTY	183	-9	1000 GAL	EMPTY
VII	34090	FIREMAN TNG FCLTY	184	-9	1000 GAL	EMPTY
VII	34090	FIREMAN TNG FCLTY	182	-9	1000 GAL	EMPTY
VIII	30964	ILS MARKER BEACON	52	-9	300 GAL	DIESEL

TABLE 3.88 (Continued)

Underground Storage Tanks

REGION	BUILDING #	BUILDING DESCRIPTION	TANK #	STATUS	DATE REMOVED	TO BE REMOVED	YEAR INSTALLED	CONTENTS	VOLUME	REPLACEMENT
II	20233	EXCH, BRANCH	169	ACTIVE			1971	MOGAS	10000	
II	20233	EXCH, BRANCH	68	ACTIVE			1971	MOGAS	10000	
II	20233	EXCH, BRANCH	103	ACTIVE			1971	MOGAS	10000	
II	20249	UTIL VAULT	122	REMOVED	01/92		-9	REMOVED	1000	
II	20249	UTIL VAULT	121	REMOVED	01/92		-9	REMOVED	1000	
II	20249	UTIL VAULT	120	REMOVED	1992		-9	REMOVED	1000	
IV	1440	SAN SEWAGE PMP STN	84	ACTIVE/NIS			0		50	
IV	10852		40	ABANDONED			1981	NOT FOUND	250	
IV	11457	COMM FCLTY	224	REMOVED	10/92		1966	SLUDGE AND WATER	15000	
IV	30117	SAN SEWAGE PMP STN	375	ACTIVE			1989	DIESEL	1000	
IV	30117	SAN SEWAGE PMP STN	116	ABANDONED			1959	NOT FOUND	250	
VII	34019	HTE FCLTY BLDG	297	ACTIVE/NIS			1978	#2 FUEL OIL	30000	
VII	34019	HTE FCLTY BLDG	296	ACTIVE			1978	#2 FUEL OIL	30000	
VII	34041	TWR CON	382	ACTIVE			1991	DIESEL	1000	
VII	34044	SHP A/SE STOR FCLTY	299	REMOVED	02/92		1966	REMOVED	3000	
VII	34044	SHP A/SE STOR FCLTY	321	REMOVED	01/92		1980	REMOVED	965	
VII	34044	SHP A/SE STOR FCLTY	319	REMOVED	02/92		1964	REMOVED	3250	
VII	34044	SHP A/SE STOR FCLTY	320	REMOVED	01/92		1980	REMOVED	965	
VII	34048	STOR LIQ OXYGEN	298	REMOVED	01/92		1959	REMOVED	1000	
VII	34052	MUN MAINT ADMIN	300	REMOVED	04/92		1959	REMOVED	3000	
VII	34066	SHP CONVL MUN	360	ACTIVE			1960	#1 FUEL OIL	3000	3000 G UST
VII	34067	STOR, RKT CHK ASMB	323	ACTIVE		12/94	1970	#1 FUEL OIL	4000	
VII	34090	FIREMAN TNG FCLTY	294	ACTIVE			1981	WASTEWATER	25000	
VII	34090	FIREMAN TNG FCLTY	293	ACTIVE			1981	JP-4	3000	

SECTION 4

NON-STORM DISCHARGES

INTRODUCTION

The pollutant source assessment phase of a SWMP requires the identification of non-storm water discharges and unpermitted connections to the storm water system. The plan must also include a certification that all storm water outfalls have been tested or evaluated for the presence of non-storm water discharges. In compliance with these requirements, PES prepared a separate report entitled "Cross-Connection Report for Wright-Patterson Air Force Base," dated 28 February 1994. The salient features of this document are summarized in this section.

INSPECTION PROCEDURES

The SWMP guidance manual published by USEPA in support of the storm water regulations describes three test methods for identifying non-storm water discharges and cross-connections. These methods include visual inspections, review of sewer maps, and dye testing. To date, PES has employed a combination of visual inspection and sewer map review.

PES personnel obtained the Base layout maps which show the location of each storm water outfall and its boundary. The boundaries of each outfall were then transferred onto the maps of the storm sewer system. Using the storm sewer maps, the final discharge point for each outfall was located and inspected during dry weather conditions. (Dry weather conditions means no precipitation in the previous 72 hours.) During this inspection, an initial determination of potential non-storm water discharges and cross-connections were made based on whether or not flow was present at each outfall.

After each outfall was located and initially inspected, all the outfalls were subjected to a visual storm drainage system inspection. This consisted of starting at the final discharge of the outfall and proceeding back upstream, checking each succeeding

manhole under dry weather conditions to visually determine if flow was present. As each point was investigated, its condition was marked on a copy of the storm system map (i.e., manholes that had flow present were marked with a circle and manholes where flow was not present were marked with a "X"). Each flow was traced back until it could be attributed to a specific building or location. If a branch of the main storm sewer line in an outfall was found to be dry and 15 inches or less in diameter, it was excluded from further inspection and classified as not subject to non-storm water discharges or illicit connections. During this portion of the investigation, some inspections were carried out 24 hours after the end of a rain event; however, any flows noted during this time were evaluated again after 72 dry hours. It was the experience of the inspection crew that none of the points investigated after 24 dry hours had changed conditions after 72 dry hours.

Upon completion of the storm sewer inspections, each non-storm water discharge or cross-connection was located on the Base utility maps in an attempt to further define its origin. After the utility maps were reviewed, a list of buildings to contact and inspect was developed. Each building was then inspected using the check list presented in Figure 4.1. The check list was developed based on information in the USEPA guidance document for the preparation of storm water pollution prevention plans and best management practices. Page 1 of the check list was used as an outline for interviewing each building contact concerning the status of the building and Page 2 was used as a compilation of other relevant observations that were made during each individual inspection. The suspected non-storm discharges at each building were also subjected to an additional visual inspection at this time.

NON-STORM DISCHARGES IDENTIFIED

All non-storm discharges identified by sewer map review and field inspection are presented in Table 4.1 and further described hereinafter by outfall area. Certification forms are included in Appendix A.

Outfall Area 1

- Building 20004 - Cooling water from compressors and air conditioners, and steam condensate (authorized non-storm discharges) as well as yet undetermined sources from floor drains.

- Building 20156 - Cooling water from a water cooled hydraulic compressor, an authorized non-storm discharge, was identified at this location.

- Building 20470 - Non-storm discharges were identified as cooling water from water cooled air conditioners and groundwater pumped from a

Facility Inspection Checklist

Building #: ______________________ Date: ______________

Building Contact: ______________________ Time: ______________

Building description: Administrative Industrial

If Industrial, describe: ______________________________________

____

SURVEY INFORMATION:

	YES	NO
• Is there any indication of non-stormwater discharges noted during the preliminary survey?	☐	☐
• Is there a material inventory on-site?	☐	☐
• Have there been any spills or leaks on-site in the last three years?	☐	☐

• Describe any non-stormwater discharges that may be present: ______________

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• Additional notes and conclusions: ______________________

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Facility Inspection Checklist

Building #: ______________________ Date: ______________

OBSERVATIONS:	YES	NO
• Does facility show signs of poor housekeeping? (Cluttered walkways, unswept floors, uncovered materials, etc.)	☐	☐
• Are there spots, pools, puddles, or other traces of oil, grease, or other chemicals on the ground?	☐	☐
• Is there discoloration, residue, or corrosion on the roof or around vents or pipes that ventilate or drain work areas?	☐	☐
• Is there leaking equipment, pipes, containers, or liners?	☐	☐
• Are there areas where absorbent materials (kitty litter, saw dust, etc.) are regularly used?	☐	☐
• Do you notice signs such as smoke, dirt, or fumes that indicate material losses?	☐	☐
• Do you smell strange odors, or experience eye, nose, or throat irritation when you first enter the work area?	☐	☐
• Do storage containers show signs of corrosion or leaks?	☐	☐
• Are there open containers, stacked drums, shelving too small to properly handle inventory, or other indications of poor storage procedures?	☐	☐
• Are there shipping/receiving docks, any outdoor handling/storage practices above-ground tanks, or equipment lay-down yards?	☐	☐
• Are there any buried materials, disposal sites, or underground tanks near the building?	☐	☐

• Brief description of storm water controls or practices currently in place (i.e., dikes, gutters, oil/water separators, etc.). ______________

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TABLE 4.1

SUMMARY OF IDENTIFIED, POTENTIAL CROSS-CONNECTIONS

OUTFALL NUMBER	BUILDING NUMBER	POTENTIAL CROSS-CONNECTIONS
1	20004A/F	COOLING WATER DISCHARGES FROM COMPRESSOR SHOP
1	20004C/D/E	WATER COMING FROM AN AS YET UNDETERMINED SOURCE IN HANGAR 4
1	20156	COOLING WATER FROM A WATER COOLED HYDRAULIC COMPRESSOR
1	20470	SUMP IN BASEMENT; APPARENT RUPTURED UNDERGROUND WATER LINE ACROSS STREET
1	20620	COOLING TOWER BLOWDOWN TO STORM SEWERS
1	20622	COOLING TOWER BLOWDOWN TO STORM SEWERS
2	20022	COOLING TOWER BLOWDOWN
3	20005	FURNACE COOLING WATER AND MULTIPLE FLOOR DRAINS
3	20018D	STEAM CONDENSATE LINES DISCHARGE TO GROUND (PAVEMENT)
3	20018G	CONDENSATE FROM LARGE HVAC UNIT DISCHARGES TO STORM
3	20018H	COOLING TOWER BLOWDOWN DISCHARGE TO STORM
3	20020	COOLING TOWER BLOWDOWN DISCHARGE TO STORM
3	20020A	FLOOR DRAINS TO STORM (RESTRICTED, NO DISCHARGE); SUMP PUMPS DISCHARGE GROUNDWATER TO STORM
3	20022B	COOLING TOWER BLOWDOWN DISCHARGE TO STORM
3	20031	SEVERAL SUMPS, FLOOR DRAINS
3	20065	MULTIPLE SUMPS AND DRAINS CONNECTED TO STORM WATER SYSTEM
3	20071	CONDENSATE FROM AIR HANDLERS, COOLING TOWER BLOWDOWN, AND FLOOR DRAINS, POSSIBLE STORM WATER TO UTILITY TUNNELS
3	20071A	FLOOR DRAIN IN C-BAY; POSSIBLE STORM WATER TO EXHAUST TUNNEL
3	20071D	COOLING TOWER BLOWDOWN DISCHARGE TO STORM
3	20076	FIRE STATION FLOOR DRAINS
3	20079	APPARENT LEAKING WATER LINE BEHIND BUILDING, STEAM BLOWDOWN, DEACTIVATED NEUTRALIZATION TANK
3	20125	COOLING TOWER BLOWDOWN DISCHARGE TO STORM
3	20145/20146	COOLING TOWERS
3	22041	SPRAY POND
4	20033	UNDERGROUND TANK, HYDRAULIC PUMPS, AND CENTRIFUGE
4	20036	FLOOR DRAINS AND AIR CONDITIONER CONDENSATE
4	20055	WASHING MACHINE
4	20066	STEAM TUNNEL LEAKS AND CONDENSATE

TABLE 4.1 (Continued)

OUTFALL NUMBER	BUILDING NUMBER	POTENTIAL CROSS-CONNECTIONS
4	20103	AIR CONDITIONERS AND WATER COOLED HYDRAULIC COMPRESSORS
5	20433	BUILDING DRAINS DISCHARGE TO INACTIVE ACID PIT TO UNKNOWN
5	20450/20452	COOLING TOWERS AND ACID NEUTRALIZATION TANK
5	20745	1992 STORM WATER RUN-ON TO ROAD SALT STORAGE; OUTSIDE WASH RACK DISCHARGE TO STORM; FLOOR DRAINS PROBABLE TO STORM
5	20770	COAL PILE RUNOFF
7	10280	AIR CONDITIONER
7	10281	AIR CONDITIONER
9	10830/10840	HVAC UNITS FROM HOSPITAL
11	10800	SWIMMING POOL AT OFFICERS CLUB CAN BE DRAINED TO STORM SYSTEM
12	30060	STORM DRAIN TO OIL/WATER SEPARATOR AT 30060 SHOULD BE DISCONNECTED; OUTSIDE FUEL PUMPS EXPOSED TO STORM WATER RUN-ON
12	30257/30258	POSSIBLE BROKEN WATER LINE BETWEEN BUILDINGS
12	31240	COAL PILE RUNOFF
12	31245	(KITTY HAWK SWIMMING POOL) CAN BE DRAINED TO STORM SYSTEM
12	31250	WATER FROM REFRIGERATION UNITS
13	30013	FLOOR DRAINS
13	30170	FLOOR DRAINS, BOILER BLOWDOWN DISCHARGE TO STORM
13	30206	FLOOR DRAINS TO SANITARY APPARENTLY RECEIVING STORM WATER INFILTRATION
13	30256	PROBABLE STORM WATER AND WASTEWATER DRAINAGE TO O/W'S; HISTORY OF OVERFLOWS
17	30017	DRAINS IN AND ADJACENT TO 30017 DISCHARGES TO STORM; SOME DRAINS PLUGGED; WORK ORDER (85178) TO INSTALL OIL/WATER SEPARATOR
17	30153	AIRCRAFT WASHING DISCHARGES TO GROUND SURFACE OR TO STORM DRAINS
17	30154	INFILTRATION WATER FROM TANKS DRAINS TO OIL/WATER SEPARATOR TO STORM; PROJECT IN 1994 TO CORRECT THIS

basement sump. Both potable water sources and uncontaminated groundwater are authorized non-storm discharge under USEPA's General Permit guidelines and are expected to be so designated in the USAF group permit.

- Building 20620 and 20622 - Non-storm discharges were identified as cooling tower blowdown.

Outfall Area 2

- Building 20022 - Cooling tower blowdown is an intermittent non-storm discharge.

Outfall Area 3

- Building 20005 - Cooling water from a vacuum furnace and air conditioner condensate (authorized non-storm discharges) as well as floor drain connections were identified.
- Building 20018 - Air conditioning condensate (authorized) and cooling tower blowdown.
- Building 20020 - Cooling tower blowdown to storm water system.
- Building 20020A - Sumps and floor drains connected to storm water system.
- Building 20022B - Cooling tower blowdown to storm water system.
- Building 20031 - Several sub-grade sumps and floor drains.
- Building 20065 - Several sub-grade sumps and floor drains are connected to the storm water system and groundwater from an adjacent hillside (authorized if uncontaminated) is a non-storm discharge.
- Building 20071 - Air conditioning condensate (authorized), cooling tower blowdown, and floor drains.
- Building 20076 - Floor drains are suspected to be connected to the storm sewer system.
- Building 20079 - Steam condensate or groundwater from an adjacent hill (authorized if uncontaminated) appear to be responsible for non-storm discharges.

- Building 20125 - Cooling tower blowdown to storm water system.

- Building 20145/20146 - Cooling tower blowdown.

- Building 22041 - Overflow from a spray pond in the parking lot.

Outfall Area 4

- Building 20033 - Centrifuge overflow and cooling water from water cooled hydraulic compressors discharge to an underground tank which is connected to the storm sewer system.

- Building 20036 - Air conditioning condensate (authorized) and suspected floor drain connections.

- Building 20055 - Overflow from a washing machine.

- Building 20066 - Leaks and condensate from a steam tunnel.

- Building 20103 - Cooling water from air conditioners and hydraulic compressors (authorized) are connected to the storm sewer system via a floor drain.

Outfall Area 5

- Building 20433 - Lab sink and floor drains from research lab connected to neutralization pit.

- Building 20450 - Cooling tower blowdown and the overflow from two acid neutralization sumps are non-storm discharges that have been identified.

- Building 20745 - Outside wash rack and floor drains connected to storm sewer system.

- Building 20770 - Storm water runoff from coal storage and handling areas.

Outfall Area 6

- Building 10262 - Non-storm discharges were identified as being either irrigation drainage or groundwater infiltration (both authorized if the groundwater is uncontaminated).

Outfall Area 7

- Buildings 10280 & 10281 - Condensate from air conditioning units (authorized) is discharged into the storm drains serving the parking lot for these buildings.

Outfall Area 9

- Buildings 10830/10840 - Non-storm discharges were identified which are suspected to be emanating from the buildings HVAC system.

Outfall Area 11

- Building 10800 - Drains from the swimming pool are connected to the storm sewer system.

Outfall Area 12

- Building 30060 - Storm drain north of building is cross-connected to an oil/water separator.

- Building 30257/30258 - Non-storm discharge at this location is suspected to be from a broken water line or groundwater infiltration (both authorized, if the groundwater is not contaminated).

- Building 31240 - Coal pile runoff to storm sewer system.

- Building 31250 - Non-storm discharge at this location is suspected to be from refrigeration units (authorized if condensate).

- Building 31245 - Drains from the swimming pool.

Outfall Area 13

- Building 30013 - Several floor drains are connected to the storm sewer system.

- Building 30170 - Floor drains and boiler blowdown are connected to the storm sewer system.

- Building 30206 - Backflooding of storm flow into sanitary sewer system.

- Building 30256 - Backflooding of storm flow into sanitary sewer system.

Outfall Areas 14, 15 and 16

- Other - Groundwater infiltration appears to be the only non-storm discharge from these areas and is authorized if uncontaminated.

Outfall Area 17

- Building 30017 - Several floor drains are connected to the storm sewer system.

- Building 30153 - Wash water from aircraft washing operations is discharged into the storm sewer system.

- Building 30154 - Infiltrated water from tank bottoms discharged through an oil/water separator to the storm sewer system.

Outfall Area 18, 19, and 20

- Other - Groundwater infiltration appears to be the only non-storm discharge from these areas and is authorized if uncontaminated.

CONCLUSIONS

Some of the non-storm discharges identified at WPAFB are authorized under USEPA's General Permit guidelines (see the discussion in Section 3, Outfall Area 1.). It is assumed that they will be so designated under the USAF group permit. While it may be beneficial to remove these discharges from the storm sewer system, in many cases this effort would be costly and/or impractical. Appropriate pollution prevention measures shall be adopted and implemented to minimize the potential exposure of these discharges to any form of contamination.

Pollution prevention measures addressing such discharges as lawn watering, sump pump discharges, or air conditioner condensate can encompass a broad range of actions. Specific plans need to be developed by the individual facilities or organizations responsible for the source of each discharge. General principles which may be applicable to such situations include source reduction, reuse, maintenance, and housekeeping practices.

Good housekeeping practices such as maintenance of clean work spaces and equipment and routine inspections help to minimize the potential exposure of sump pump discharges or condensate to sources of contamination. Preventive maintenance and prompt equipment repair will also contribute to minimized exposure. In the case of air

conditioning condensate, maintenance and repair efforts may also help reduce the quantity of condensate generated.

The consumption of water for lawn watering and golf course irrigation represent an area where source reduction strategies could have a significant impact. A variety of strategies can be employed to reduce the quantity of water applied, including timing of applications, substitution of grasses which require less water, maximized use of landscaping options (i.e., natural plant communities) which require little or no watering, and reduced frequency of mowing. Strategies to minimize quantities of pesticides, herbicides, and fertilizers and coordination of application schedules to avoid overlap with watering schedules will help minimize potential contamination from these sources. Finally, storm water runoff can be reused for lawn watering or golf course irrigation whenever it is available from settling basins, ponds, constructed wetlands, etc.

Unpermitted connections to the storm sewer system must either be removed or an application made for a specific NPDES permit for the discharge. General control principles, as well as recommended actions for specific facilities are discussed in detail in Section 5.

SECTION 5

MANAGEMENT PRACTICES AND GUIDELINES

INTRODUCTION

Three activities at WPAFB account for the majority of releases with the potential to contaminate storm water runoff. These are: runway de-icing, aircraft de-icing, and aircraft maintenance and refueling operations conducted outdoors. Efforts to minimize releases from these sources will result in the most immediate and demonstrable improvements to storm water runoff quality.

With respect to runway de-icing, finding an appropriate substitute for the granular urea which is currently used appears to be the best approach to minimizing the release of potential contaminants. Potassium acetate appears to be the best choice among materials currently approved for application on USAF runways. Implementing this approach at WPAFB would require conversion from the current granular system to a liquid storage and application system. Targeting such a conversion for the 1994/1995 de-icing season would allow time for further evaluation of this approach and acquisition of storage/application equipment. Other practices currently in place include utilization of an electronic runway monitoring network, runway plowing and sweeping practices, and restriction of chemical de-icing to the main runway. These practices would be compatible with the use of potassium acetate and constitute Best Management Practices for minimization of chemical de-icing.

Aircraft de-icing is conducted at both the East and West Ramp areas by several organizations at WPAFB. Propylene glycol is used Basewide and no feasible alternatives appear to be currently available. A strategy to contain aircraft de-icing runoff and divert such effluent to the sanitary sewer system is proposed as the most immediate and cost effective means of eliminating such discharges to the environment. Consolidating de-icing services under a single organization (645 LOG/LGMT) would insure consistency in the application of de-icing practices and could contribute to a minimization of de-icing costs. Further investigations should address: 1) the content of propylene glycol formulations for the presence of potentially harmful or toxic additions, and 2) modification of equipment or technique to minimize quantities of propylene glycol used. Alternative de-icing technologies are currently within the sphere of research and

development. Several organizations at WPAFB could potentially contribute to such R&D efforts.

Aircraft maintenance and refueling operations which are conducted outdoors create a variety of opportunities for contamination of storm water runoff. While many of these activities are concentrated within the East and West Ramp areas, the term also refers to use, maintenance, and storage of vehicles and ground support equipment wherever such functions occur outdoors. Implementation of management, procedures, and training efforts are required to effectively minimize and contain the relatively large numbers of leaks and spills associated with these activities. Effective utilization of other programs (Spill Prevention and Response, Pollution Prevention, etc.) can contribute to achieving progress in this area. A more detailed investigation of past and present practices at WPAFB is required to develop specific recommendations, which are compatible with contemporary airfield practices.

Additional specific areas of concern include:

- Oil/water separators.
- Coal, DRMO, and CE storage yards.
- Open air testing and training practices.
- Construction site erosion control.

Apparently a number of undocumented oil/water separators are in use at several locations around the Base. Several sources have cited problems with the performance or effectiveness of these units, other sources identify inappropriate discharges or failure to properly maintain the separators. Storm water regulations will probably change the legal status of some units which currently discharge to storm sewers. Careful documentation of the source of waters discharging to oil/water separators will be important to determining the appropriate discharge (storm or sewer) from such units. Maintenance practices need to be upgraded so as to insure that oil/water separators operate at the full potential of their design efficiency.

An A/E study under contract to CE Infrastructure is currently addressing the oil/water separator issues at WPAFB. The study (currently at 35% design stage) will assess units Basewide and recommend repairs, modifications or replacement on a case by case basis. Recommendations of this study should be reviewed by EM to insure compliance with storm water regulations.

Large scale outdoor storage practices can create dramatic visual impacts as well as opportunities for storm water contamination, wind blown debris, and related problems. It is important that currently proposed projects to address previously identified problems be

fully implemented, as well as installing basic structural controls to minimize future storm water exposure. A more detailed assessment of feasible options is needed before committing to potentially capital intensive options such as full enclosure or relocation.

Open air testing and training practices of greatest concern at WPAFB include firefighter training and survivability testing of aeronautical equipment. These operations have in the past constituted significant sources of non-storm discharges. Both sources currently employ oil/water separators to treat their wastewater discharges and both operations are currently undergoing major renovations which will further improve control of their respective waste streams. However, renovation at both facilities needs to be reviewed to insure compliance with forthcoming storm water regulations and to avoid costly last minute modifications of the renovation designs. Operations at the Survivability Course were discussed in Section 3, Outfall Area 3. Fire training operations are discussed later in this section.

Erosion from construction site activities can create significant opportunities for contamination of storm water runoff. Although the issue has been addressed by updating the text of the Contractor's Basic Specifications, inspection and enforcement of the new standards is needed Basewide to insure full compliance. Extensive ongoing construction activities throughout WPAFB are creating numerous opportunities for sediment collection in storm drainage systems and ultimate discharge of suspended solids from the Base.

Discussion of management practices in the following section is organized around broad functional categories. These include: 1) flight support/maintenance operations, which are subject to industrial classification under paragraph viii, airport operations; 2) shipping/receiving and materials handling (SIC 4255, paragraph xi); 3) waste management and recycling (paragraph vi and vii); 4) de-icing practices (SIC 4581, paragraph viii); 5) POL and UST practices (SIC 4581); 6) construction and erosion control; 7) pesticide/herbicide applications; 8) fire training practices; 9) the Base IRP (paragraph v); and 10) other environmental management programs. These general topics are then followed by a review of compliance activities and site-specific BMPs recommended for WPAFB. Such actions would be supplemented to established baseline management practices as described in USEPA guidance (Storm Water Management for Industrial Activities) and as currently practices Basewide.

FLIGHT SUPPORT AND MAINTENANCE OPERATIONS

Flightline operations at WPAFB include the industrial shops that perform repair, testing, and calibration activities; utilities such as cooling towers and wash racks; hangars for aircraft storage and maintenance; and runway fueling. The primary function of these facilities is keeping the aircraft ready to fly in a safe condition.

All industrial shops along the flightline are located in fully enclosed structures. This feature reduces the exposure of industrial materials to rainfall contact and provides the opportunity for constructing curbs or other types of containments for spills. Floor drains which may have been connected to the storm sewer system present the greatest potential for pollution from non-storm discharges. These drains should be rerouted to the sanitary sewer system or plugged.

Blowdown from cooling towers is a significant non-storm discharge at WPAFB. Reuse options should be explored and implemented if cost effective or the discharge rerouted to the sanitary sewer system. Most wash racks are fully enclosed and connected to the sanitary sewer system. Those that have been identified as non-storm discharges should be relocated or the flow diverted to sanitary sewers.

Hangars generally provide a fully enclosed structure. Exposure to rainfall can occur if the doors are left open to allow entrance of wind blown rain. Permanent spill containment structures would interfere with operations inside the hangar; however, drip pans could be used to contain minor leaks of hydraulic fluids and other lubricants from the aircraft. Floor drains should be disconnected from the storm sewer system by rerouting to sanitary sewers or plugging.

Runway fueling operations create potential non-storm discharges and runoff of leaks during storm events. Spill prevention and response plans are in effect to minimize the risk of storm water contamination and to provide immediate containment as well as clean-up of these leaks. Condensation of evaporated fuels may need to be addressed as it affects "topping off" fuel tanks of aircraft. Drip pans are suggested for aircraft parked along the runways for extended periods of time.

Aircraft refueling is performed by the 645 LOG/LGMT, 906th FG/MAQ and the 907th MS/LGGF. The JP-4 fueling system consists of 11 above ground storage tanks and a hydrant system which contains over 50 underground tanks. The majority of fuel transferred from the fuel storage system to aircraft at WPAFB is JP-4. In addition, aviation fuel is transferred from storage tanks to small aircraft. Aircraft refueling is performed by either using the hydrant system (single point refueling) or fuel tank trucks (over the wing refueling).

Review of the Fuel Spill Response List from July 17, 1991 through October 1, 1993 revealed that the majority of fuel spills occurred on the taxiway, East and West Ramps, and Zone G. Most spills were two gallons or less in volume. Approximately 14, 33, and 36 spill response reports were filed in this time period, for the years 1991, 1992, and 1993, respectively. Most of these spills occurred from venting aircraft or from mechanical failure (e.g., stuck valve). Several of the spills from venting aircraft occurred when the bowser placed under the aircraft, which is used to catch fuel, overflowed.

Overall, the magnitude of the majority of fuel spills, with the exception of fuel tank leaks, and ground/aircraft emergencies, were very small or insignificant. Fuel spills from aircraft venting frequently occur during warm weather. However, these ventings are about one gallon and are not a concern since a large amount of the spilled fuel is either evaporated or absorbed when absorbent is used to remove the fuel. During aircraft venting, care should be taken to ensure that bowsers do not overflow.

Finally, good refueling operating practices, properly maintenanced fuel tank trucks, and routinely inspected fuel tanks would significantly reduce fuel spills at WPAFB.

SHIPPING/RECEIVING AND MATERIALS HANDLING

Shipping and Receiving consists of two organizations, 645 LS/DMTTR and 645 LG/DMTTFP, housed in the same building (30071). All goods with a U.S. Government bill of lading come directly to this building upon entering the Base. They are stored inside temporarily until hauled by a contractor to their next destination. Separate areas are designated by tape lines on the floor for various hazardous materials. Packages are not opened unless received in a damaged condition, producing minimal amounts of waste.

Hazardous materials are hauled to Building 30002 for centralized storage and dispensing on an as needed basis to various organizations on the Base. Approximately 8,000 pounds of hazardous materials that have exceeded their expiration date and 150 pounds of hazardous waste generated at the Base are also stored in this building each year. Outdated material is picked up by DRMO for resale, reuse, or recycle. Hazardous wastes are disposed through EM and DRMO. Neither Building 30002 nor Building 30071 is a suitable facility for this activity and both have been cited by ECAMP surveys. In Building 30002, the floor is at ground level, subject to windblown rain accumulation even when the overhead doors are closed. Loading/unloading operations and materials stored on the floor are therefore exposed to rainfall. Spill containment is not provided at the door or in the storage areas. Both facilities lack adequate protection or spill containment for hazardous materials in storage. Miscellaneous out of date goods stored in an annex building (30002D) are overcrowded and unprotected as well. A new hazardous material storage facility is projected to be available in 1995. Interim measures to prevent pollution in the storm sewer system will need to be implemented while the new facility is being constructed. These might include sloping the floor away from the overhead doors, a protective overhang, concrete curbing, or other containment structures.

WASTE MANAGEMENT AND RECYCLING

Hazardous Waste Management

Hazardous wastes generated at WPAFB include flammable solvents, industrial process chemicals (plating wastes, etc.), fuels that cannot be reclaimed or recycled, and small quantities of a wide variety of chemicals (organic and inorganic, liquid, and solid) used in R&D laboratory activities. Approximately 50 tons of hazardous waste are generated annually by Base activities.

WPAFB Regulation 19-4 mandates implementation of the Hazardous Waste Storage Permit System which is currently being put into effect. Each site that generates and stores hazardous waste beyond the end of a regular work shift is required to be permitted. The system will standardize hazardous waste storage at all Base satellite and accumulation points. Satellite points allow temporary storage of as much as 55 gallons of hazardous waste for 72 days. Accumulation points allow storage of an unlimited volume of waste for up to 90 days.

The new permitting system will serve as an improved management tool for WPAFB in that it will assist in determining where hazardous waste is being stored. Another advantage is that it will allow tracking of the various types and quantities of waste being generated and ensure that the individuals managing waste are properly trained. Confirmation of training and a site-specific spill plan are required before each permit is issued.

An additional benefit of the system is that proper storage and spill containment provide the best management plan for preventing pollution from entering the storm sewer system. Exposure to rainfall has been nearly eliminated by moving drums under cover. Facilities lacking spill containment structures are being replaced or refurbished to meet permit conditions.

Solid Waste Management

Solid waste management at WPAFB consists of the collection and disposal of sanitary waste, construction debris, ash, and asbestos, as well as waste collected as part of the Morale, Welfare, and Recreation (MWR) recycling program. Refuse from military housing areas and other Base trash is stored in weatherproof receptacles and hauled to off-Base disposal sites by contractors. Medical and pathological wastes are stored inside prior to pick up by a hauling contractor for incineration. Construction debris and ash are periodically removed for off-Base disposal; however, exposure to rainfall can occur if interim covering is not employed. Asbestos generated by abatement projects is double-bagged, barrelled, and stored in waterproof receptacles prior to contractor pick up for disposal.

Recycling

MWR operates the recycling program for most non-hazardous wastes, while the DRMO provides recycling for scrap metal, cooking oil, grease, scrap meat and bones as well as some hazardous wastes. Refuse bins are located around the Base for collection of recyclable paper. Special boxes are also available in various facilities for aluminum cans, bi-metal cans, and plastic bottles. Sorting and baling are performed inside the MWR facility. The commissary also has an indoor bailing operation for the cardboard it generates. If the material is not exposed to storm water runoff, recycling and recovery activities pose no pollution potential and help to decrease the volume of solid waste disposal by WPAFB.

DE-ICING PRACTICES AT WPAFB

Runway De-Icing

Runway cleaning and de-icing services are performed by 645 CE, Pavement/Equipment (Bldg 10867A, phone 7-7233). Runway conditions and the need for de-icing are determined by 645 Logistics, Base Operations (Bldg 30206, phone 7-6206). Granular urea is the only material currently employed for de-icing, which is applied to the main runway and access taxiways in Area C (Outfall Areas 14, 15, 16, 17 and 18). During the relatively mild winter of 1992/1993, a total of 83,000 pounds of urea was applied for Runway de-icing. Efforts are employed to minimize urea applications due to cost efficiency and environmental impact considerations.

Base Operations monitors conditions on the main runway with a Surface Condition Analyzer (SCAN) system manufactured by Surface Systems, Inc. (SSI). The SCAN system was installed at WPAFB in November 1990 and was operational as of 1 December 1990. The SCAN system is operated at numerous airport and highway applications throughout the upper midwest and has been designated as the USAF Standard System. All USAF flying bases in the northern tier of North America will eventually have the SCAN system installed.

At WPAFB, the SCAN system includes seven surface monitors and one subsurface monitor (18" below grade) installed on the main runway. The monitors report data (air and surface temperature, relative humidity, precipitation) to a control processing unit which also receives atmospheric data from the local weather service. This information is used to forecast the advent of freezing conditions up to 12 hours in advance. Base Operations will install software and perform the predictions in-house this year, replacing the forecasting services formerly provided on a contract basis by SSI.

Base Operations has found the SCAN system to be highly accurate and reliable. The system can distinguish wet from dry, can distinguish ice from slush, and provides an

indication of the concentration of de-icing chemicals in surface water. On a scale of 0 to 100, a fresh application of urea will register between 50 and 80. Under continued dilution from fresh rainfall, this reading will gradually return to the background level of five to 10. There is a general consensus that operation of the SCAN system has permitted a significant reduction in the quantities of urea applied, but no data to support this conclusion was available for WPAFB. The annual variability of urea application rates due to fluctuating weather conditions makes it difficult to interpret application rates directly.

When freezing conditions are predicted, urea is applied to the main runway (12,600' x 300') and to the major taxiways providing access to/from the runway. The ramps and other taxiways are not chemically de-iced. The surfaces of the taxiways and ramps are cleared with ice-blade and broom equipment. The quantity of urea applied for a given event is highly variable, depending on airfield and weather conditions at the time of application.

Base CE is currently equipped only for application of dry de-icing chemicals. Currently approved alternative chemicals (potassium acetate or isopropyl alcohol) require a storage tank and liquid spray application system. The feasibility of converting to one of the liquid de-icing systems is currently being investigated by Base CE.

Aircraft De-Icing

Aircraft de-icing at WPAFB is currently performed by the following operations:

- 645 LOG/LGMT - 257-4039.
- 4950th Test Wing - 257-3594.
- 906th FG/MAQ - 257-0376 or 257-4349.
- 907th MS/LGGF - 257-0073.
- Contract Maintenance - 257-3240 or 257-4909.

All aircraft de-icing operations at WPAFB utilize Type I propylene glycol. This has been in effect since the winter of 1991/1992, when the Base discontinued use of ethylene glycol. Supply Logistics (257-6422) reports that 24,884 gallons of propylene glycol were utilized for Basewide de-icing operations during the relatively mild winter of 1992/1993. De-icing operations are conducted in accordance with the applicable maintenance operating instructions of each Wing or flight group.

De-icing of transient aircraft is provided by 645 LOG/LGMT. Such aircraft may be of any size and a variety of large and small portable spray units are utilized as needed. De-icing may be performed anywhere on the East Ramp (Outfall Areas 13 & 14) where such aircraft are stationed. There is very little surplus hangar space available to visiting aircraft, therefore, de-icing is the primary treatment method for this group of aircraft.

There is no recovery system available on the East Ramp and all runoff of de-icing fluids drains to the storm sewer system.

The 907th relocated to WPAFB during 1993 and does not have an established record of de-icing experience at this Base. The 907th used approximately 1500 gallons of de-icing fluid at Rickenbacker AFB during the winter of 1992/1993. At WPAFB, their de-icing operation will be located at the West Ramp area (Outfall Area 18). Only limited hangar space is available in the form of a "nose dock" which could protect the front half of the fuselage and wings of one C-141. As with the East Ramp, there is no recovery system available on the West Ramp and all de-icing fluids drain to the storm sewer system.

The 4950th Test Wing also operates from the West Ramp and performs de-icing of C-18s and C-135s on an as-needed basis as determined by the flight engineer. There is some hangar availability to protect aircraft from bad weather which minimizes the need for de-icing. Out of four hangars, there is normally enough space available to accommodate one or two aircraft. The 4950th is currently relocating to Edwards AFB, California; the winter of 1993/1994 will be their last winter season at WPAFB. The contact person did not know if the hangar space would become available to the 907th after the transfers were completed.

The 906th Fighter Group conducts operations from the East Ramp area. Up to 16 aircraft can be accommodated in the hangar spaces available to this group. Operating specifications prohibit the application of de-icing chemicals to the F-16 aircraft currently maintained by this group. The fighters are prepared for flight inside the hangars and kept inside until takeoff time.

C-12 and C-21 aircraft are managed under civilian contract at Hangar 145, East Ramp. This group also performs a minimum of de-icing due to the availability of adequate hangar space in which flight scheduled aircraft can be protected. Standard procedure in this group is to conduct "hangar launch," in which pre-flight preparation and checkouts are completed before the aircraft leaves the hangar. In the event de-icing is required, this group has an arrangement with 645 LOG/LGMT to provide such services.

Available Options for Runway De-Icing

The use of urea for runway de-icing poses several avenues of potential pollution. Urea degrades by hydrolysis to ammonia and is subsequently converted to nitrate by nitrifying soil organisms. The acute toxicity of ammonia to aquatic life is relatively high, while nitrate stimulates eutrophication processes and is a potential contaminant of drinking water supplies. Finally, the biodegradation of urea, glycols, and other organics may result in objectionable odors due to the release of aldehydes.

Constituents of applied runway de-icers at WPAFB can be expected to be conveyed fairly quickly to receiving surface waters (Outfall Areas 15, 16 & 17) under typical weather conditions which mandate de-icing. Degradation of urea is minimal in river water of less than 8°C, thus contributing to long-term transport and dilution of winter time releases from the Base. However, freezing storms occurring in late Spring, when receiving waters are somewhat warmer, could lead to relatively more rapid degradation of urea within Base receiving waters.

An option to runway de-icing with urea is currently available and approved for USAF applications. Liquid potassium acetate has been successfully applied in both commercial and USAF settings and offers substantially less potential environmental impact. The compound decomposes to potassium, a common mineral in the environment; while acetate exerts a BOD as it metabolizes to carbon dioxide and water. However, the BOD is significantly less than that resulting from equivalent applications of urea, and the secondary risks associated with ammonia and nitrate degradation are eliminated.

The cost of potassium acetate appears to have fallen somewhat during the past two years, but remains almost twice as expensive as urea ($4.75/gal versus $2.60/gal as of September 1993). However, application rates under equivalent conditions have been reported at about one-third the rate for urea. If such advantages were to prove true at WPAFB, use of potassium acetate would be cost effective in addition to dramatically reducing the net BOD discharge to the aquatic environment.

Implementation of potassium acetate runway de-icing at WPAFB would require acquisition of liquid storage and application systems. An important component of the application system would be a sophisticated spray boom capable of precisely controlled, pressurized spraying. Such capability is important to maximizing the range of conditions under which the potassium acetate may be applied (i.e., snow packs or ice layers) as well as minimizing the quantity as appropriate to different situations.

Potassium acetate is reported to be most effective when applied to clean runways as a deterrent to ice or frost formation. The material does not evaporate, remaining effective for up to 24 hours. Use of potassium acetate in this manner is also reported to contribute to improved runway surface friction and skid resistance.

Runway de-icing procedures currently in place at WPAFB are designed to minimize the quantity of chemical agents employed. With the exception of acquiring a liquid storage/application system, the practice would be immediately applicable to the use of potassium acetate. These practices include: 1) restriction of de-icing chemicals to use on main runway and access taxi usage only (ramps and other areas are mechanically cleared), 2) plowing and brooming of main runways to remove snow; chemicals are applied to clean runways to prevent accumulation of ice or frost, and 3) use of the SCAN system to monitor runway conditions and predict the onset of freezing conditions.

The available literature regarding potassium acetate is highly encouraging, but circumstantial. WPAFB should identify appropriately similar facilities currently implementing potassium acetate in conjunction with SCAN systems (i.e., Scott AFB) and monitor their experience through the 1993/1994 season. Barring discovery of significant negative factors or superior alternatives, WPAFB should plan for conversion to a potassium acetate system for the 1994/1995 de-icing season.

Available Options to Aircraft De-Icing

WPAFB has already implemented a number of practices which help to minimize the quantities of aircraft de-icing chemicals escaping to the environment. Conversion to propylene glycol has eliminated potential toxicities associated with former use of ethylene glycol. Maximum use of hangar space reduces the number of aircraft requiring de-icing. Finally, preliminary blowing/brushing of aircraft reduces the amount of chemical applications required.

Glycol based de-icing formulations exert high BOD on receiving waters and present a potentially high toxicity impact as well. The high BOD rates result from the extremely oxygen demanding, rapid biodegradation of glycols within soil or aquatic systems. Glycols, per se, present relatively low toxicity impacts, but other compounds or additives to glycol de-icing formulations may be acutely toxic to aquatic habitats. Such formulation components may include rust inhibitors, acetaldehyde, dioxane, corrosion inhibitors, polymer thickening agents, and surfactants.

It should be noted that the quantity of aircraft de-icing compounds used at WPAFB is probably less than what would be consumed at a commercial airport operating a similar number of flights. WPAFB is in a better position to utilize its hangars for flight preparation and in some cases may be able to simply postpone or reduce the level of flight activities during inclement weather.

One option available for consideration at WPAFB would be to centralize aircraft de-icing services under a single organization. The host organization, 645 LOG/LGMT, might be the most logical choice. Centralization would permit consolidation of equipment, more cost effective training, and consistent employment of de-icing procedures designed to minimize the quantities of chemicals applied. A second option would be to review de-icing procedures and equipment to determine if smaller quantities of chemicals can be utilized. Other short-term opportunities for changing current aircraft de-icing practices are somewhat limited. All such alternatives require careful consideration from the perspective of flight safety as well as environmental impact and cost effectiveness. Such a review should address: 1) the potential BOD and toxicity impacts of the formulation currently used, 2) the availability of less toxic formulations, 3) trade offs between Type I and Type II de-icing systems for propylene glycol, and 4) availability and feasibility of alternative de-icing chemicals. Currently available reference

materials contained no information regarding availability of an alternative to glycol based de-icing compounds.

A more immediate approach to aircraft de-icing is to prevent the release of such effluents to the environment. Such an approach could entail diversion of de-icing effluents to the sanitary collection systems, diversion to a containment/treatment system, or recovery/recycle of the effluents. Although numerous airports are currently evaluating and/or implementing such options, very little information based on established experience is as yet available.

A glycol recovery system is probably the most capital intensive option, especially with respect to the cost of converting existing ramps. Such a system requires recovery of large quantities of concentrated fluids (i.e., 15 percent glycol), restricts de-icing operations to specific locations, and could create a bottleneck if large numbers of aircraft need to be mobilized quickly. Given the relatively small quantities of waste glycols generated at WPAFB, such recovery/recycle would probably not be feasible.

Diversion of aircraft de-icing effluents to a wastewater treatment system is technically feasible (with respect to treatment) and has been implemented at some airports. Where very large quantities of effluents are expected (i.e., the new Denver airport), containment ponds can be installed to control and monitor release of the effluent to the sanitary collection system. However, in situations where only a few aircraft per day might be de-iced, direct discharge to the sanitary system may be acceptable, if such discharge could be isolated from general storm water flows.

Such an option could be implemented at the West Ramp area at WPAFB (where the majority of aircraft de-icing is performed) and would entail the following steps:

1. Isolate the ramp storm drains from the surrounding storm drain system;

2. Connect the ramp storm drains to a single point of outlet to the storm drain system;

3. Connect an underground storage tank to the outlet point;

4. Provide for pumped discharge from the tank to a sanitary line; and

5. Install a gate device which allows discharge to either the storm line or to the storage tank.

With these modifications installed, precipitation to the ramp areas would be routinely discharged to the storm drainage system. However, effluents from aircraft de-icing operations would be diverted to the storage tank and then conveyed to the Fairborn

treatment plant. In addition, the availability of the tank would provide an additional means of containment in the event of fuel spills on the flightline.

Cost Estimates for Runway and Aircraft De-icers

Review of the limited available literature on runway and aircraft de-icers indicated that potassium acetate (E36™) appears to be the preferred candidate to replace urea as a runway de-icer. Similarly, propylene glycol seems to be best candidate to replace ethylene glycol. However, there are some tradeoffs for each type of de-icing system.

Potassium Acetate (E36™)

E36™ seems to be a good substitute for granular urea as a runway de-icer. BOD values are much lower for E36™ and there are no releases of glycol, ammonia, or nitrates to the aquatic environment. The primary disadvantage in replacing urea with E36™ as a runway de-icer is the cost of converting to a new application system. For WPAFB, these costs would include: sprayer system, tank truck, and storage tank.

The cost of a Batts Pro 2000 sprayer including a GMC truck (10 ton tank truck) is approximately $125,000 (December 1991 dollars). The sprayer system includes a 50 foot boom with three sections, hydraulic pump and controls. The sprayer system without the truck costs approximately $65,000 (December 1991 dollars). E36™ should be stored in its original shipping container or containers constructed of polyethylene, stainless steel, lacquer lined mild steel or glass. The cost of a 5,000 gallon stainless steel tank is approximately $52,700. Costs for 2,000, 5,000 and 10,000 gallon stainless and carbon steel tanks are presented in Table 5.1.

The other principal cost factor is the cost of the de-icer compound itself. At the present time the cost of potassium acetate (E36™) is almost twice as expensive as liquid urea ($4.75/gal versus $2.60/gal as of September 1993). There is no evidence (i.e., studies) that the application rate for E36™ would be significantly less than the application rate for urea, however, informed reviews have suggested that application rates for E36™ could be as much as one third the rate for urea. Application rate varies with weather conditions and application methods. Suggested application rates of E36™ are shown in Table 5.2.

Propylene Glycol

Propylene glycol seems to be a good substitute for ethylene glycol and has been adapted for use at WPAFB for aircraft de-icing. It appears not to be as toxic as ethylene glycol. However, propylene glycol has a BOD_5 @ 20°C of 400,000 to 800,000 mg/L. Methods are needed to reduce the amount of propylene glycol entering the storm water. Approximately 49 to 80 percent of de-icers applied to aircraft falls on the apron. The remainder remains on the aircraft or is dispersed to the air.

TABLE 5.1

STORAGE TANK COSTS

CAPACITY (GALLONS)	STAINLESS STEEL COSTS ($)[A,B]	CARBON STEEL COSTS ($)[A,B]
2,000	33,000	12,100
5,000	52,700	20,000
10,000	76,900	33,000

[A]INCLUDES INSTALLATION COSTS. INSTALLATION COSTS ARE ASSUMED TO BE 40 PERCENT OF THE PURCHASED-EQUIPMENT COST.
[B]PURCHASED-EQUIPMENT COSTS ARE BASED ON COST DATA OBTAINED FROM PETERS AND TIMMERHAUS <u>PLANT DESIGN AND ECONOMICS FOR CHEMICAL ENGINEERS</u>. COSTS ARE ADJUSTED TO NOVEMBER 1993 DOLLARS USING THE CHEMICAL ENGINEERING PLANT COST INDEXES.

TABLE 5.2

SUGGESTED APPLICATION RATES OF E36™ RUNWAY DE-ICER

DE-ICING			
PACKED SNOW & ICE DEPTH (INCHES)	AIR TEMPERATURE		
	20°F - 32°F (GAL/1000 FT^2)	10°F - 20°F (GAL/1000 FT^2)	LESS THAN 10°F (GAL/1000 FT^2)
2 TO 3	3.7	4.6	9.1
1 TO 2	1.8	2.7	6
1/2 TO 1	1.2	1.8	3
LESS THAN 1/2	0.9	1.2	1.8
GLARE ICE	0.9	1.2	1.8

ANTI-ICING	
RUNWAY CONDITION	APPLICATION RATE GALLONS/1000 FT^2
EXPECTING GENERAL SUBFREEZING PRECIPITATION OR ICING CONDITIONS	1/3 GAL
EXPECTING FREEZING RAIN	1/2 GAL

There are three methods of reducing the amount of propylene glycol entering the storm water. First, a retention pond can be built to collect storm water containing propylene glycol. If concentrations (i.e., BOD_5) are below the NPDES limits, then the water in the retention pond would be allowed to enter the storm water system. If the concentration is above the limits, then a small amount of the storm water per the Metropolitan Sewer District (MSD) conditions would be allowed to enter the MSD system (daily limit).

A second method of reducing propylene glycol to the storm water is to install a recovery system. A system of drains connected to a recovery tank in the vicinity of the de-icing system would be needed. To insure high concentrations of propylene glycol, a centralized de-icing system is recommended. If recovery costs are too high, the recovery tank can be used to slowly release propylene glycol to the MSD system. In addition, Type I propylene glycol instead of Type II propylene glycol would be recommended as a de-icer with a recovery system, since it contains a higher percent of propylene glycol; thus making recovery easier. Type II fluids should not be used on aircraft that have rotational speeds of 85 knots or less, since Type II fluids tend to stay on the aircraft wing during takeoff. A concentration of 15% of propylene glycol in the storm water is needed to make this recovery system feasible.

Finally, a third method would use an absorbent material to reduce the amount of propylene glycol entering the storm water. The absorbent material is applied to the pavement surface after an aircraft is sprayed with glycol. The glycol-laden absorbent is then vacuum swept and disposed of in a landfill, preventing 40% of the glycol from entering the storm water.

Based on the available information, a small recovery tank can be built to collect propylene glycol. Since quantities of propylene glycol are small, a retention pond and a recovery system are not economically feasible. Propylene glycol from the recovery tank can then be released to the MSD system at a slow rate. Permission from MSD is required before a storm water connection to the sanitary line can be made. The cost of installing a 5,000 gallon carbon steel tank is approximately $20,000. Costs of storage tanks are shown in Table 5.1.

In addition, the costs of installing pipe from the two de-icing areas are approximately $135,000. Piping costs are shown in Table 5.3.

The total cost of converting the runway de-icer from granular urea to potassium acetate is shown in Table 5.4. In addition, the cost for reducing the amount of propylene glycol into the storm water is presented in Table 5.4.

TABLE 5.3

PIPING COSTS

LOCATION	PIPE LENGTH	PIPE DIAMETER	$/FT OF PIPE	TOTAL COST
AIRCRAFT PARKING APRON AT RUNWAY 23 TO BUILDING 4029	1200 FEET	30" TO 6"	75	$90,000
AIRCRAFT DE-ICING OPERATIONS ON APRON NEAR SKEEL AVE.	600 FEET	30" TO 8"	75	$45,000

TABLE 5.4

COST ESTIMATES FOR REPLACING OR REDUCING RUNWAY AND AIRCRAFT DE-ICERS

OPTIONS	EQUIPMENT COST	DEICER COSTS
RUNWAY DEICER/ANTI-ICER		
REPLACE GRANULAR UREA WITH POTASSIUM ACETATE, PURCHASE TRUCK AND SPRAYER SYSTEM AND STORAGE TANK	$125,000 - TRUCK AND SPRAYER SYSTEM (SPRAYER SYSTEM COSTS $65,000) $52,700 - STORAGE TANK	1992/93 USAGE OF GRANULAR UREA WAS 83,000 LBS @ $235/TON. APPLICATION RATE IS APPROXIMATELY 5 LB/1000 FT^2. APPLICATION AREA WAS APPROXIMATELY 16,200,000 FT^2. TOTAL COST OF GRANULAR UREA WAS $9,750. SIMILARLY, COSTS FOR POTASSIUM ACETATE FOR THE SAME APPLICATION AREA WOULD BE $25,650 ($4.75/GAL X 1/3 GAL/1000 FT^2 X 16,200,000 FT^2). THE COST INCREASE IN USING POTASSIUM ACETATE AS A DE-ICER IS APPROXIMATELY $15,900 PER YEAR BASED ON THE DATA PRESENTED ABOVE.
AIRCRAFT DEICER/ANTI-ICER		
INSTALL TWO HOLDING TANKS FOR PROPYLENE GLYCOL RUNOFF FROM AIRCRAFT. INSTALL PIPING TO DIVERT THE STORM WATER (PROPYLENE GLYCOL) FLOW TO THE SANITARY LINES.	$135,000 - PIPING COSTS $40,000 - HOLDING TANKS (2)	ALREADY IN USE.

PETROLEUM, OIL, AND LUBRICANT (POL) MANAGEMENT

Introduction

Fuels stored and handled at WPAFB include aviation fuels (JP-4 and aviation gasoline), motor vehicle fuels (gasoline and diesel), and fuels for stationary and external combustion engines (diesel). Storage consists of above ground and/or underground tanks of various sizes located in all outfall areas, except 2, 16, and 18. Operation of the bulk POL storage facilities at WPAFB is generally in compliance with environmental regulations. POL storage tanks with a capacity greater than 660 gallons are required to have secondary containment for spill control. Containment structures for above ground tanks are generally concrete dikes coated with a sealant. Secondary containment for underground storage tanks (USTs) usually consists of double wall construction, with a leak detection system placed in the interstitular space, and cathodic protection.

Containment structures for existing above ground tanks will be upgraded to concrete, where required, during Fiscal Year 1994. Operating procedures should include daily inspection of each containment area to assure that it is in good condition and no residues are present. Floor drains and sumps should be fitted with operable closure devices (normally closed) connected to oil/water separators with valved discharges so that treated storm water can be drained to the storm sewer system, treated waste streams from the release of accumulated tank condensate can be diverted to the sanitary sewer system, and spills contained for recovery.

A management program for USTs is well underway to determine compliance status and provide Basewide upgrades. All USTs have been inventoried and tested for leakage. Upgrading will include installation of leak detection equipment, cathodic protection, and monitoring on a frequent basis. Several leaking UST sites are currently under assessment for removal and replacement with units meeting current regulations.

POL Tank Farm

The POL tank farm is located in Area C in Outfall 17. There are 11 large floating roof storage tanks which contain JP-4. Each tank is surrounded by gravel berms or dikes and drainage from the dike system consists of a catch basin that is partially plugged with gravel and a six inch shut-off valve which is also plugged, disabling the valve to be closed. Downstream of the shut-off valve is a concrete oil/water separator (approximately 500 gallons capacity). The outlet of the oil/water separator is directed to the storm sewer and eventually dumps into the river. Wastewater (from condensation and seepage through vents in the floating roofs) is routinely removed from the bottom of the storage tanks and dumped into steel drums. This wastewater contains ethylene glycol which is stripped from the fuel.

There is a project underway to retrofit fixed roofs over the floating tank roofs and install high fuel level alarms. This has been accomplished on four of the tanks (Tanks 249, 250, 254, and 255) under a previous project. The current project involves the seven remaining tanks (Tanks 251, 252, 253, 256, 257, 258, and 271) and addresses the need to remove all aqueous film-forming foam (AFFF) and fuel that spills into the diked area around each of the 11 JP-4 tanks. Outflow from the drainage catch basin will be directed to a new 1,000 gallon oil/water separator. The separator will remove fuel from water and AFFF; however, the water/AFFF mixture cannot be separated as AFFF is water soluble. The water/AFFF solution will be directed to the sanitary sewer if it is tested and meets the Fairborn Wastewater Treatment Facility (FWWTF) requirements or to a 5,000 gallon concrete holding tank where it can be slowly routed to the FWWTF. Wastewater removed from the bottoms of the tanks will be hard connected to the new 1,000 gallon oil/water separator rather than manually dumped into steel drums. It is also planned to upgrade the gravel dikes to concrete.

UST Management Program

There are 50 USTs that are to be removed, 35 of these will be replaced with new tanks (31 USTs and four above ground tanks). Two of the 50 tanks are located off-site (Tanks 111 and 329) and therefore are not addressed in this report. The tanks scheduled for removal/replacement are indicated in the UST tables for each outfall (Tables 3.5, 3.14, 3.20, 3.26, 3.31, 3.36, 3.40, 3.46, 3.53, 3.60, 3.66, 3.69, 3.74, 3.81, and 3.86).

Contaminated soil removed in this process is being stock piled in Area C across from the POL tank farm. Contaminated soil is protected against exposure to storm water at both the excavation and stock pile locations. Soils are piled on vis-clean and covered with vis-clean as well. At the stock pile, covers are stabilized and a top layer of straw is utilized to protect the vis-clean from ultraviolet radiation.

WPAFB plans to use a thermal treatment unit for final clean-up of the soil. A permit is currently being sought to bring a thermal treatment unit on-site. However, the soil remediation process will likely not begin until all of the USTs have been removed.

CONSTRUCTION AND EROSION CONTROL

Construction Activities

CE added Erosion Control requirements to Construction Contractor Basic Specifications during 1993 in response to a request from Environmental Management. Specifications are referred at Section 0110 (Summary), 01015 (Project General Requirements), 01010Y and 01010-2 for small projects. These stipulations require the contractor to submit an Erosion Control or Storm Water Control Plan which provides the

basis for CE review of construction activities. CE is also responsible for submitting a copy of the proposed plan to the Base EM office for review.

The status of compliance with construction site erosion control requirements was reviewed by the 1993 internal ECAMP inspections conducted by the EM office. Some compliance deficiencies were noted and two citations (NCR-2 and NCR-3) were issued to encourage more complete communication and enforcement of the erosion control program.

Construction stipulations require contractors to submit a Notice of Intent (NOI) and follow OEPA permit conditions. Projects under five acres are not subject to OEPA but must comply with WPAFB specifications and submit the appropriate plan. If earthwork is less than five acres then the plan must follow the format of OEPA document, "Authorization for Storm Water Discharges Associated with Construction Activity Under the National Pollutant Discharge Elimination System," specifically site description, controls, and inspection. WPAFB Basic Specifications require contractors to submit an erosion control plan when earthwork is greater than one acre or when the potential for sediment to enter the storm drainage system exists. For all earthwork, the contractor is required to take adequate measures to:

- Reduce by the greatest extent practicable the area and duration of exposure of readily erodible soils.

- Protect the soils by use of temporary vegetation, or seeding and mulch, or by accelerating the establishment of permanent vegetation.

- Retard the rate of runoff from construction site and control disposal of runoff.

- Trap sediment resulting from construction in temporary or permanent silt holding basins. This includes pump discharges resulting from dewatering operations.

- Provide temporary measures for the control of erosion in the event construction operations are suspended for any appreciable length of time.

- Provide protection against discharge of pollutants such as chemicals, fuel, lubricants, sewage, etc. into any stream.

WPAFB should implement a program for preventive and corrective maintenance of sediment control structures in completed construction projects. The program should consist of inspections conducted periodically to assure that control structures remain functional, and that nonstructural BMPs are observed. The inspections should evaluate the integrity of outfall structures, erosion control structures including protective covers of

IRP sites, performance of flow measuring devices, and water quality monitoring records. At a minimum, the following steps should be included in WPAFB Erosion Control requirements of Construction Contractor Basic Specifications.

- Immediate sodding or seeding of finished structures.

- Advance installation of final storm drain facilities in construction areas to achieve maximum use during the construction period.

Areas Subject to Erosion

Two areas have been identified at WPAFB which are currently subject to erosional processes. One area consists of an exposed bluff or barren hillside which drains to storm water Outfall Area 4. The other area is a section of bank along the Mad River (east bank), opposite the Fairborn Wastewater Treatment Plant (Storm Water Region VII).

Erosion problems at the Mad River location were cited in the 1992 ECAMP inspections (NCR-5). The river cuts into the bottom of a 10-15 foot high escarpment along this section, causing a periodic collapse of the overlying soil layers. Work and funding requests have been submitted to implement erosion control measures at the site, but the project (92-0242) remains unfunded at this time.

Preliminary assessments for this project indicate that installation of a revetment is required along the east bank of the Mad River and that excavation and fill is needed along both the east and west banks. Further development of the control plan should address the extent to which other on-Base actions may support the objectives of the control plan. Such actions as bank stabilization, revegetation, runoff controls (diversion, retention, or infiltration) or access restrictions; on-site or in upgradient areas, may contribute to minimizing erosional factors at the site. However, any control plan should also address the potential impact of factors related to upstream practices such as water level fluctuations, sediment loads, etc. The control plan should identify the extent to which the success of on-site control efforts are dependent upon such upstream influences.

The exposed bluff is located approximately 200 feet north of the Wright Memorial in Area B. It extends for approximately 800 feet in an east to west direction and rises approximately 120 vertical feet. The bluff is bounded to the north by the CONRAIL RR and State Route 444 and lies almost entirely to the north of the WPAFB property line. Presumably at least a portion of the exposed bluff lies within the RR property or right of way zone and routine maintenance of the right of way could potentially contribute to sediment transport from the site. Most of the area drains to storm water Outfall 4 (NPDES Outfall 3), however a minor portion of the area may drain into storm water Outfall 5.

USAF property at the top of the bluff includes lawns, trees, and brushy area. The Wright Memorial and a small parking area are the only structures; these are at least 200 feet back from the sloped areas. Six prehistoric mounds are located near the western edge of the bluff. Slopes along the eastern and western flanks of the bluff are less steep, heavily wooded, and do not appear to be contributing erosional runoff at this time.

Runoff from the bottom of the bluff flows to the west in a ditch parallel to the CONRAIL RR. The ditch eventually connects to the outfall for storm water Area 4. Some type of sediment basin in the vicinity of the outfall would help reduce sediment discharges from all of the drainage area, in addition to discharges from the bluff area. However, actions to eliminate the source of erosion would require stabilization structures, vegetation, and runoff diversion along the base and face of the bluff. Such an effort would require participation by CONRAIL to assure that control measures are compatible with RR operation and to establish shared responsibilities for project funding, construction, and long-term maintenance.

PESTICIDE, HERBICIDE, AND FERTILIZER OPERATIONS

The Basewide program of pesticide, herbicide, and fertilizer applications is conducted by CE-Entomology. The two golf courses at WPAFB operate independently but are subject to the same procedures and rules. A private contractor maintains lawns and grounds in the residential portion of the Base.

The 1993 ECAMP inspections noted that pest control contracts were not being reviewed by CE-Entomology, EM, or by MAJCOM. The citation (P-1) noted that lack of review could result in applications of non-approved compounds at WPAFB. A review system employing the appropriate points of oversight is being developed.

The procedures and rules employed per application of pesticides and herbicides at WPAFB are conducted under guidance of the following USAF Regulations: AF Reg 91-21: Pest Management Program and AF Manual 91-19: Herbicide Manual. These regulations specify training/certification for standards, operational guidance, etc.

All operators are certified under State and/or Department of Defense (DOD) standards, and new personnel are immediately enrolled in a certification program. Entomology operations follow either the USAF guidance or the product label. Labels for each pesticide/herbicide contain certain detailed precautionary statements addressing: mixing procedure, appropriate/inappropriate uses, non-target animals, distance from water, weather conditions, type of safety equipment to wear, areas to or not to apply, etc.

On-the-job training of personnel emphasizes compliance, use of common sense, proper techniques, equipment maintenance, trouble shooting, proper containment and disposal. The Entomology facility was built to meet all applicable storage regulations--

State, Base, and DOD. Materials are purchased separately for each golf course; these are delivered to and stored at Entomology until used. Both golf courses have excellent mixing systems for fertilizer and pesticides.

Existing BMPs for reduction of runoff contamination by pesticide and fertilizer use are as follows:

1. Bulk products and application equipment, along with mixing and preparation areas, are housed in a central facility (Building 10278). This covered facility precludes contact of runoff with stored or spilled pesticides.

2. Pesticide application is not conducted during rain events and is scheduled primarily during dry months.

3. Application equipment is maintained to avoid leakage.

4. Adequate records of pesticide use are maintained. Current WPAFB regulations require daily tracking of pesticide use and preparation of a quarterly usage report for the pest control program.

Other BMPs for reduction of runoff contamination by pesticide and fertilizer use are as follows:

1. Leaving or planting native vegetation to reduce water, fertilizer, and pesticide needs.

2. Integrated pest management where appropriate.

FIREFIGHTER TRAINING

Firefighter training is currently conducted at Facility 34090, northwest of the West Ramp area. The primary focus of this training is aircraft fire fighting. Under the current system, up to 400 gallons of JP-4 may be burned at each training session. Water, foam, and fuel from the exercise go through a separator (Unit #33) and into a 2,000 gallon holding tank, which subsequently discharges water to a storm drain ditch.

The fire training facility is to be converted to a new system which will burn propane rather than JP-4. The new system is currently in the design stage and is scheduled for installation in approximately two years.

New storm water regulations will prohibit continued discharge of the fire training wastewater, unless a NPDES permit is obtained for this source. One means of

compliance would be to employ the 2,000 gallon holding tank as a containment unit. Tank contents would be pumped out and transported to a POTW or to a sewer line connection and all discharge of training wastewaters would cease.

Other fire training activities produce minimal impacts on storm waters. Very small quantities of kerosene are burned with straw to generate smoke for structural training exercises. These exercises are conducted inside a training structure so that burned straw residues are not exposed to storm waters. In the past, the department occasionally trained by burning down old buildings. This practice has become rather infrequent; only one building was burned during 1993.

Fire training activities, facilities, and proposed modifications need to be reviewed in the context of the storm water regulations. All new facilities and proposed new exercises will need to be designed so as to eliminate any discharge of waste fuels or untreated wastewaters to surface drainages.

IRP SITE DESCRIPTION

WPAFB is listed on the National Priorities List. A Consent Order with the State of Ohio (signed February 1988) and a Federal facilities agreement with USEPA, Region V (signed March 1991) are the primary regulatory structure under which the Base conducts its program. The Base IRP is executed through the Restoration Branch of the EM Office (645 ABW/EMR). EMR has a staff of 20 people, including the division chief who is also the remedial project manager. The staff consists of four geologists, seven engineers, four environmental protection specialists, two contract negotiators, and one public affairs specialist.

Over 200 monitoring wells have been installed at the IRP sites to date. Of the 65 sites, 17 are in the site investigation phase, 23 are in the remedial investigation phase, and 25 are finished. Although no sites are currently in the remedial action phase, several sites will be undergoing interim remedial action in Fiscal Year 1993. The staff has projected that they will meet the USAF goal of finishing site remediation at WPAFB by the year 2000. With the support of the OEPA and USEPA, the EM staff is currently addressing their highest priority projects--Landfills 8 and 20 and Operable Unit 2.

Current management practices implemented in conformance with the above agreements are adequate to protect the IRP sites against potential contamination of storm water. All IRP sites at WPAFB have a vegetation cover or other surface protection which minimizes the risk of storm water runoff contamination. To further mitigate runoff from these areas, the following management practices should be implemented:

- Maintain the integrity of IRP site protective covers and inspect regularly to assure compliance.

- Prohibit construction in the immediate vicinity of IRP sites until contamination sources are removed and the soils are properly remediated.

- Take special care during remediation activities to prevent the exposure of contaminated soils to rainfall by temporary covers or other protective measures and divert all off-site runoff by constructing berms around the affected area.

- Storm water runoff which comes in contact with any contaminated soils should be contained and discharged to the sanitary sewer system or conveyed to other appropriate treatment.

Descriptions of the IRP sites to be remediated are presented in Appendix D.

IMPACT OF ESTABLISHED ENVIRONMENTAL PROGRAMS

Ongoing environmental programs and plans implemented at the Base have a positive effect on minimizing storm water pollution problems. These programs include:

- Spill Prevention and Response Plan - May 1993.

- Environmental Compliance Assessment and Management Program (ECAMP) - 17 November 1992.

- Baseline Pollution Prevention and Analysis - 22 July 1993.

- Boundary Surface Water Sampling Program - 1993/1994.

Spill Prevention and Response Plan

This plan describes measures to be taken to prevent spills and containment of spills, if they occur. The plan covers all activities on the Base and addresses both oil and hazardous substances (including hazardous wastes and materials). The plan was intended to fulfill the requirements for: 1) a Spill Prevention Control and Countermeasure (SPCC) plan per 40 CFR 112, 2) an Oil and Hazardous Substance Pollution Contingency (OHSPC) plan per 40 CFR 300, 3) the Resource Conservation and Recovery Act per 40 CFR 260-271, and 4) the hazardous waste spill prevention and response requirements of AFR 19-8, and AFR 355-1.

Section 2 of this plan is a Spill Prevention Control and Countermeasures (SPCC) Plan that describes the facilities and procedures to ensure that:

- All storage and transfer sites for both oils and hazardous materials are adequately designed to prevent spills.

- The operators of the storage and handling sites are trained in spill prevention, control, and reporting procedures.

- The operators have adequate spill containment and clean-up materials.

- All storage is routinely monitored to prevent or limit undetected spills.

- The route and effect of a potential spill is known.

Site specific contingency plans have been prepared for each site that contains petroleum products or hazardous materials. A key component in all these plans is containment of any spill to prevent it from entering a storm or sanitary sewer. After a spill is cleaned up, procedures are in place to inspect the sewers and insure that they have not been contaminated.

Environmental Compliance Assessment and Management Program (ECAMP)

An environmental compliance evaluation of this Base was conducted during the period of 10-15 August 1992, under the direction of the Office of Environmental Management. This evaluation included the following compliance categories:

Air Emissions
Hazardous Materials Management
Hazardous Waste Management
Natural and Cultural Resources Management
Noise Management (Environmental)
Pesticide Management
POL Management
Solid Waste Management
Special Programs
Water Quality Management

A number of these categories, including hazardous waste; pesticides; petroleum, oil, and lubricant (POL) storage; and water quality have potential impacts on storm water discharges. There were no significant findings in the Hazardous Materials Management, but there were 27 major findings mainly involving storage of materials. These areas of concern have been addressed and are now in compliance. In the Hazardous Waste Management category, there was one significant negative finding and 49 major negative findings. These findings dealt mainly with waste storage and identification, and record keeping. These findings were corrected. One negative finding regarding pesticides affected the sanitary sewer system and has been corrected.

The POL and tank management program was considered excellent by the ECAMP team. There were 25 major negative findings, mainly involving spill clean-up and secondary containment. A number of these problems could have impacted storm water discharges due to potential leaks of both above ground and underground tanks. These specific problem areas have been corrected, and ongoing surveillance in the POL category is being maintained to prevent spills and leaks and to implement prompt clean-up when they do occur.

Most of the ECAMP Water Quality Management review identified concerns in the water supply and sanitary sewer system. A number of negative findings related to storm water were also documented. These included an oil sheen at Outfall Area 2 which is still unresolved. Clarifiers that inadequately treat boiler blowdown water and discharge to the storm water system were also identified. This problem is being resolved and water will be properly treated prior to discharge. In another finding, steam leaks were identified as leaking into the storm sewer. These lines were repaired.

Additional ECAMP investigations will be made periodically to insure continued compliance with environmental management plans and procedures.

Pollution Prevention Program

As part of the USAF Pollution Prevention Program, Wright-Patterson AFB has developed a Baseline Pollution Prevention Report. This report describes the following:

- organizations and their missions;
- work performed;
- materials used in the waste generating processes;
- waste assessment;
- waste characteristics, types, and quantities; and
- fate and disposal of the generated wastes.

For each facility inspected, the report addresses the materials used in each process along with a flow diagram of the materials and the waste generated. New technologies, equipment, and materials which could reduce and/or eliminate the hazardous waste steam are described.

As these technologies are further evaluated and, where feasible, implemented, a decrease in hazardous waste will be achieved. This waste reduction and elimination has

an indirect benefit on storm water discharge since the potential for release into the storm water is greatly decreased.

COMPLIANCE ACTIVITIES

A wide variety of activities could contribute direct or indirect benefits to the quality of storm water runoff from WPAFB. In a number of cases, recognition of the need to remediate storm water impacts has already resulted in project commitments. Other activities currently being implemented are the result of related issues (spill prevention, sanitary wastes, etc.) but will also produce improved storm water quality. Storm water quality will also be an indirect beneficiary of a variety of other ongoing programs, including the IRP, underground storage tank removals, hazardous waste management, hazardous material tracking, etc. A summary of current projects which will directly impact storm water management at WPAFB is presented in Table 5.5. While all of these projects have received some form of approval, final funding and scheduling of some projects is not yet completed. Timely completion of these projects is encouraged due to their beneficial impacts on storm water runoff. If any of these projects are significantly delayed, postponed, or cancelled, additional actions may be necessary to address storm water issues related to the project in question.

A number of additional storm water control measures could contribute to improved storm water management as well as to general issues of environmental management. Establishing priorities for implementation of such controls should take into account identified potential sources of pollutants at WPAFB. Planning for some items, such as elimination of cooling tower discharges, can begin without delay. Other items, such as constructed wetlands, are long range possibilities which are dependent on prior planning and feasibility review. Table 5.6 presents an initial list of proposed control measures. Note that current practices for some of these measures have been summarized in previous sections of this chapter.

SITE-SPECIFIC BMPS

The following BMPs have been identified for prevention of storm water pollution in designated drainage areas of WPAFB.

<u>Outfall Area 1</u>

1. Reuse blowdown discharge from cooling towers in Buildings 20620 and 20622, or reroute discharges from the storm sewer system to the sanitary system.

TABLE 5.5

CURRENT PROJECTS ADDRESSING STORM WATER ISSUES

PROJECT #	NAME	PROJECT DESCRIPTION	STATUS
93-0190	FLOW WEIRS (CLASS I)	OUR NPDES PERMIT REQUIRES CONTINUOUS MONITORING AT OUR OUTFALL POINTS. THE NEED FOR MONITORING AND FLOW WEIRS WAS NOTED DURING THE PAST THREE INTERVIEWS.	90% DESIGN
93-0183	INSPECT, REPAIR, REPLACE OIL WATER SEPARATORS; SANITARY (CLASS I)	MANY OF OUR SEPARATORS ARE IN NEED OF REPAIR OR REPLACEMENT TO ENSURE THAT THEY MEET THE PRETREATMENT STANDARDS ESTABLISHED BY FAIRBORN AND DAYTON. ALSO ENSURE NO LEAKAGE TO SURFACE OR GROUND WATERS.	35% DESIGN
93-0187	INSPECT, REPAIR, REPLACE OIL WATER SEPARATORS; STORM (CLASS I)	MANY OF OUR SEPARATORS ARE IN NEED OF REPAIR OR REPLACEMENT TO ENSURE COMPLIANCE WITH STATE WATER QUALITY STANDARDS REQUIRING NO SHEEN ON SURFACE WATERS.	35% DESIGN
92-0207	INSTALL NEUTRALIZATION AT 20770 (CLASS I)	THIS PROJECT WILL INSTALL NEUTRALIZATION ON THE EFFLUENT FROM THE CLARIFIER WHICH CAN REACH A PH OF 2. THIS DISCHARGE VIOLATES OAC 3745-1-04 AND STATE WATER QUALITY STANDARDS.	CONCEPT DESIGN
90-0150	REPAIR SANITARY SEWER (CLASS II)	SEWERS AT THE BASE CURRENTLY LEAK AND DISCHARGE UNTREATED WASTE TO GROUND WATER. THESE WASTES MAY SUBSEQUENTLY DRAIN INTO THE STORM SEWER SYSTEM.	IN DESIGN
90-0175	REDIRECT DRAINS DEMINERALIZATION PLANT F34012 (CLASS I)	DRAIN FROM DEMINERALIZATION SYSTEM AT FACILITY 34012 DISCHARGES CAUSTICS TO STORM SEWER. PROJECT WILL RECONNECT TO SANITARY AND PROVIDE FOR PH ADJUSTMENT. THIS IS AN UNPERMITTED DISCHARGE AND A CROSS-CONNECTION TO THE STORM SEWER. OAC 3145-1-04 AND 40 CFR 122.26 PROHIBIT THE DISCHARGE.	UNKNOWN STATUS
93-1843	CONSTRUCT AIRCRAFT WASHING FACILITY (CLASS I)	AIRCRAFT AT THE MUSEUM ARE CURRENTLY WASHED OUTSIDE, SOAPS ARE DISCHARGED TO THE GROUND AND STORM SYSTEM. PROJECT WILL INSTALL AN OUTDOOR WASH AREA THAT ALLOWS DISCHARGE OF SOAP TO THE SANITARY. UNCONTROLLED AND UNPERMITTED DISCHARGE OF SOAP TO SURFACE WATERS IS A VIOLATION OF OAC 3745-1-04.	90% DESIGN
92-0242	MAD RIVER EROSION CONTROL (CLASS II)	SEVERE EROSION PROBLEM REQUIRES THE INSTALLATION OF A REVETMENT ALONG THE EAST BANK OF THE MAD RIVER. EXCAVATION AND FILL IS NEEDED ALONG THE EAST AND WEST BANKS. THE MAD RIVER IS A STATE RESOURCE WATER AND ANY EXCESSIVE INTRODUCTION OF SEDIMENT IS IN VIOLATION OF THE CLEAN WATER ACT AND OHIO ADMINISTRATIVE CODE 37541-1-04.	

TABLE 5.5 (Continued)

PROJECT #	NAME	PROJECT DESCRIPTION	STATUS
86-3743/ 93-3203	STORM WATER CONTROL MEASURES (PHASED PROJECT), DRAINAGE IMPROVEMENTS (CLASS II)	INSTALL POLLUTION CONTROL STRUCTURES TO CHANNEL AND DIVERT STORM WATER COLLECTION SYSTEM, CORRECT SANITARY AND STORM SEWER CROSS-CONNECTIONS, PROVIDE AN AIRCRAFT DE-ICING AREA, PROVIDE VEGETATION TO PREVENT EROSION OF EXISTING DRAINAGE, PROVIDE SHEDS AND BERMS, AND PROVIDE CONTROLS TO REDUCE SUSPENDED SOLIDS IN RUNOFF. WILL SATISFY CLEAN WATER ACT REQUIREMENTS UNDER 40 CFR 122. ALSO NEED TO BE IN COMPLIANCE WITH THE NPDES PERMIT.	PHASE I IS 30% DESIGNED
T.O. 93-10	NEUTRALIZATION FOR FACILITY 31240 (CLASS I)	THE DISCHARGE FROM THE CLARIFIER AND COAL PILE HAS A PH OF 2-3 AND DISCHARGES DIRECTLY TO A DITCH ALONG S.R. 444. THIS DISCHARGE IS A VIOLATION OF THE CLEAN WATER ACT. THIS PROJECT WILL INSTALL AN ACID NEUTRALIZATION SYSTEM TO TREAT THE CLARIFIER EFFLUENT.	65% DESIGN
93-3209	FIRE TRAINING FACILITY (CLASS III)	EXISTING FACILITY HAS HAD A HISTORY OF ENVIRONMENTAL PROBLEMS INCLUDING MANY FUEL SPILLS AND WASTEWATER TANK OVERFLOWS. NEW FACILITY WILL USE PROPANE INSTEAD OF JET FUEL, ELIMINATING THE NEED FOR AFFF. WATER FROM FIRE TRAINING EXERCISES WILL BE ROUTED TO A HOLDING POND AND EVENTUALLY DISCHARGED TO THE MAD RIVER.	90% DESIGN
N/A	INSTALL NEW OIL/WATER SEPARATOR AT 20094	SURVIVABILITY RANGE USES LIVE AMMUNITION AND FUEL FIRES TO TEST AIRCRAFT COMPONENTS. EXISTING SEPARATORS SERVE THE OPERATING CATCH BASIN, AND TANK CONTAINMENT AREA. A NEW 15,000 GALLON SEPARATOR WILL RECEIVE STORM WATER RUNOFF FROM THE GENERAL AREA AND WILL DISCHARGE TO THE STORM SYSTEM.	N/A

TABLE 5.6

PROPOSED STORM WATER MANAGEMENT CONTROLS AT WPAFB

POTENTIAL SOURCE OF STORM WATER POLLUTION	PROPOSED CONTROL MEASURE(S)
RUNWAY DE-ICING	EVALUATE PRESENT OPERATING PROCEDURES AND IDENTIFY OPPORTUNITIES TO MINIMIZE AMOUNTS OF DE-ICING/ANTI-ICING CHEMICAL APPLICATION RATES. IMPLEMENT FEASIBILITY PLANNING FOR CONVERSION FROM UREA TO POTASSIUM ACETATE DE-ICING SYSTEM.
AIRCRAFT DE-ICING	EVALUATE OPPORTUNITIES TO MINIMIZE OVERALL AMOUNT OF DE-ICING CHEMICALS USED. IMPLEMENT FEASIBILITY PLANNING FOR A CENTRALIZED AIRCRAFT DE-ICING FACILITY, WITH CONTAINMENT AND DISCHARGE TO SANITARY SEWER.
FIRE TRAINING OPERATIONS	FOLLOWING COMPLETION OF CURRENT TRAINING FACILITY UPGRADES, EVALUATE FEASIBILITY OF DEVELOPING CONTAINMENT AREA FOR TESTING OF AFFF SYSTEMS. EVALUATE ALTERNATIVE MEANS OF DISPOSAL OF WATER FROM FIRE TRAINING EXERCISES.
COOLING TOWERS	A TOTAL OF 13 COOLING TOWERS HAVE BEEN IDENTIFIED WHICH DISCHARGE BLOWDOWN WATER TO STORM SEWERS. IMPLEMENT PROJECT TO CONNECT DISCHARGE FROM THESE UNITS TO SANITARY SEWERS.
OUTSIDE STORAGE AREAS - BULK MATERIALS	CE MAINTAINS A VARIETY OF MATERIAL STORAGE ACTIVITIES INCLUDING TWO CURRENT SALT DUNES, AND OPEN STOCKPILES OF TOPSOIL, ASPHALT, AND CONSTRUCTION DEBRIS. DRMO MAINTAINS A SCRAP YARD FOR METALS RECYCLING AS WELL AS OPEN STORAGE OF OTHER MATERIALS. STORM WATER PROTECTION FOR THESE AREAS MAY REQUIRE, AS APPROPRIATE: DIKING OR CURBING TO MINIMIZE RUN-ON OF RAINWATER; USE OF FABRIC FENCES, STRAW, SEDIMENT TRAPS, ETC. TO MINIMIZE SEDIMENT RUNOFF; AND COVERED STORAGE OF MATERIALS WHEREVER FEASIBLE.
AREA-WIDE POINT/NON-POINT SOURCES	A CONSTRUCTED WETLANDS APPROACH COULD TREAT STORM FLOW RUNOFF FROM ONE OR MORE COMPLETE OUTFALL AREAS FOR TOTAL SUSPENDED SOLIDS, NUTRIENTS, AND METALS. RUNOFF FROM OUTFALL AREA 5 HAS BEEN SUGGESTED AS A CANDIDATE FOR THIS APPROACH. A SPECIFIC PROJECT DESIGN MUST ADDRESS EFFLUENT CHARACTERISTICS, AVAILABLE LANDS FOR WETLANDS CONSTRUCTION, AND A PROGRAM TO MONITOR PERFORMANCE OF THE SYSTEM.
SEDIMENT RUNOFF FROM DRAINAGE DITCHES	DRAINAGE DITCH 5 (WHICH SERVES OUTFALL AREA 15) HAS ACCUMULATED SEDIMENT DUE TO CONSTRUCTION ON THE FLIGHTLINE. THIS (AND ANY SIMILAR ACCUMULATION) SHOULD BE REMOVED. INSPECTION/ENFORCEMENT PROVISIONS OF THE CONSTRUCTION CONTRACTOR BASIC PROVISIONS-EROSION CONTROL REQUIREMENT SHOULD BE UTILIZED TO PREVENT FUTURE OCCURRENCES.
EROSION FROM RR BLUFF	DEVELOP PLANS FOR JOINT PROJECT WITH CONRAIL TO CONTROL EROSION FROM BLUFF AT NORTH BOUNDARY OF STORM WATER AREA 4. PROJECT COMPONENTS MAY INCLUDE DOWNSTREAM SETTLING BASIN AND ON-SITE VEGETATION AND STABILIZATION STRUCTURES. CURRENT MINIMAL IMPACT MAINTENANCE OF THE BLUFF TOP AREA AND FORESTED SIDE SLOPES SHOULD BE MAINTAINED.

2. Reroute floor drains tied to storm sewers in Building 20004A/F to sanitary sewers, or plug drains.

3. Confirm source(s) of unidentified flow associated with Building 20004A/F.

4. Investigate water percolating from ground across the street from Building 20470. The source of this flow may be a leaking water or sewer line or may be a natural source (i.e., spring or seasonal aquifer).

5. Review Part B permit application for Buildings 20478 and 20479 for compatibility with applicable storm water regulations.

6. Monitor discharges of cooling water, basement sumps, and/or condensates from Buildings 20004A/F, 20156, and 20470 to assure no exposure to potential sources of contamination; reroute discharges to sanitary sewer wherever feasible.

Outfall Area 2

1. Reuse blowdown discharge from cooling tower in Building 20022, or reroute the discharge from the storm sewer system to the sanitary system.

Outfall Area 3

1. Reuse blowdown discharge from cooling towers in Buildings 20018, 20020, 20022B, 20071D, 20125, 20145, and 20146, or reroute the discharges from the storm sewer system to the sanitary system.

2. Reroute floor drains tied to storm sewers in Buildings 20005, 20020A, 20065, 20071, 20071A (C-Bay), 20076, 20031, and 20079 to sanitary sewers, or plug drains.

3. Monitor discharges of cooling water, condensates, and/or basement sumps from Buildings 20005, 20018D, 20018G, 20020A, and 20031 to assure no exposure to potential sources of contamination; reroute discharges to sanitary sewers wherever feasible.

4. Investigate infiltration of storm water to utility tunnels and/or exhaust tunnels at Buildings 20071 and 20071A; review potential exposure of storm water to sources of contamination, how storm waters are discharged.

5. Confirm status of deactivated neutralization tank at Building 20079; assure that nothing drains into the tank.

6. Floor drains from 20092 and 20352 discharge to an oil/water separator (Unit S92-1) which discharges to the storm sewer. The separator also receives storm water from the roof and vicinity of 20092. Need to employ feasible modifications to eliminate potential non-storm discharges.

7. Scheduled new oil/water separator at Survivability Range (20094) should minimize potential contamination of storm water. Monitor effectiveness of system after it is installed.

8. Install overhead canopies, other appropriate measures to minimize storm water contamination from fueling activities at 20089 and 20464.

Outfall Area 4

1. Reroute floor drains tied to storm sewers in Buildings 20033 and 20036 to sanitary sewers, or plug drains.

2. Monitor discharges of cooling water, condensate, and/or basement sumps from Buildings 20033, 20036, 20066, and 20103 to assure no exposure to potential sources of contamination; reroute discharges to sanitary sewer wherever feasible.

3. Reroute washing machine discharge from Building 20055 from storm discharge to sanitary sewer discharges.

4. Monitor status of inactive Building 20066, minimize further accumulation of water in basement, obtain OEPA approval to treat and discharge existing water.

Outfall Area 5

1. Reuse blowdown discharge from cooling towers in Buildings 20450 and 20451, or reroute the discharge from the storm sewer system to the sanitary system.

2. Reroute floor drains tied to storm sewers in Buildings 20433, 20450, and 20745 to sanitary sewers, or plug drains.

3. Confirm status of inactive acid pit at Building 20433, assure that nothing drains into the tank.

4. Reroute discharge from active acid neutralization pits at Buildings 20450 and 20452 (B-Wing and E-Wing) from storm sewer to sanitary sewer.

5. Install appropriate control measures to outside storage areas at Buildings 20743 (DRMO storage yards) and 20745 (CE yards and soil stockpiles) so as to minimize potential contamination of storm water.

6. Implement inspection program to assure that all items accepted by DRMO have been drained of all fuels, hydraulic fluids, oils, refrigerants, any material which could potentially leak to the environment while in storage at DRMO facilities.

7. Monitor progress and control efficiency of expanded treatment system serving coal pile and area runoff from Building 20770.

Outfall Area 6

1. Install overhead canopies, other appropriate measures to minimize storm water contamination from fueling activities at 10298.

Outfall Area 7

1. Reuse blowdown discharge from cooling towers/chillers at Buildings 10280 and 10281, or reroute discharges from the storm sewer system to the sanitary system.

2. Install appropriate control measures to outside storage areas at 10876 (CE yards and stockpiles) so as to minimize potential contamination of storm water.

Outfall Area 9

1. Monitor discharges of cooling water and/or condensates from HVAC units at 10830/840 (Base hospital) to assure no exposure to potential sources of contamination; reroute discharges to sanitary sewer wherever feasible.

Outfall Area 11

1. Monitor operation and maintenance of swimming pool at Building 10800 to assure no discharge of chlorinated water to the storm sewer system; evaluate feasibility for reuse or discharges to sanitary sewer.

Outfall Area 12

1. Install storm water curbing and weatherization at ground level doors #5 and #6 at Building 30002 to prevent water running into areas where hazardous materials are stored.

2. Install overhead canopies, other appropriate measures to minimize storm water contamination from fueling activities at 30060.

3. Reroute storm drain north of 30060 from oil/water separator (Unit 18) to storm sewer system; storm drain is currently plugged, floods area during heavy rain.

4. Monitor progress and control efficiency of expanded treatment system serving coal pile and area runoff from heating plant at 31240.

5. Monitor operation and maintenance of swimming pool at 31245 to assure no discharge of chlorinated water to the storm sewer system.

6. Monitor discharge of cooling water and/or condensation from refrigeration equipment at the Base commissary at 31250.

<u>Outfall Area 13</u>

1. Reroute floor drains tied to storm sewers in Buildings 30013 and 30170 to sanitary sewers, or plug drains.

2. Install storm water curbing and weatherization at ground level receiving doors at Building 30013.

3. Reroute boiler blowdown discharge at Building 30170 from storm sewers to sanitary sewers.

4. Install oil/water separators to floor drains from Building 30206; repair drain lines as necessary to correct apparent infiltration of storm water runoff to sanitary sewer system.

5. Repair drainage system at 30256 to prevent storm water from overflowing oil/water separators.

6. Install overhead canopies, other appropriate measures to minimize storm water contamination from fueling activities at 30109 and 30119.

<u>Outfall Area 17</u>

1. Reroute floor drains tied to storm sewers in Building 30017 to sanitary sewer, or plug drains; monitor correct installation of new oil/water separator (Work Order 85178).

2. Review Building 30017 de-icing procedures to aircraft barrier arresting equipment. Review feasibility for minimization of chemicals used and opportunities to contain effluent for discharge to the sanitary system.

3. Review swimming pool maintenance procedures of Building 30022 to assure that chlorinated waters are discharged to the storm sewer system.

4. Install modifications or relocate aircraft washing at 30153 to prevent discharge of effluent to storm drainage system.

5. Monitor renovation projects and equipment upgrades at fuel operations (30154) to assure compliance with applicable storm water regulations.

Outfall Region VII

1. Review design of a new fire training facility regarding applicable storm water regulations. Monitor subsequent operations and efficiency of control mechanisms to assure continued compliance.

SECTION 6

COMPLIANCE EVALUATION AND MONITORING PLANS

COMPLIANCE PLAN

Annual site compliance inspections are comprehensive inspections performed by personnel designated in the SWMP as having responsibility for conducting storm water inspections. The inspectors should be familiar with USEPA storm water regulations and the SWMP. The inspectors should also have direct access to management decisionmakers with regard to environmental compliance issues.

This annual inspection will then be used to evaluate the overall effectiveness of the SWMP. In particular, the inspections should be geared toward verifying the location of potential pollutant sources, that drainage maps are accurate and reflect current conditions, that controls identified to reduce storm water pollution are in place and working, and identify any needs for additional controls.

The process for conducting the evaluation should include these items:

- Review the SWMP and draw up a list of those items which are part of material handling, storage, and transfer areas covered by the plan.
- List all equipment and containment in these areas covered in the plan.
- Review facility operations for the past year to determine if any more areas should be included in the original plan, or if any existing areas were modified so as to require plan modification; change plan as appropriate.
- Conduct inspections to determine: 1) if all storm water pollution prevention measures are accurately identified in the plan, and 2) are in place and working properly.
- Document findings.

- Modify SWMP as appropriate.

All documentation regarding conditions necessitating modification to the SWMP should be kept on file as part of the plan for at least three years.

Compliance

WPAFB has already established an ECAMP to ensure overall Base compliance with environmental regulations. Storm water issues have been specifically identified within ECAMP since 1992. Except as specifically noted elsewhere in this section, annual storm water compliance inspection requirements will be accomplished under the annual ECAMP inspections. The ECAMP inspection team will include a representative who is familiar with the storm water regulations and the SWMP.

The objectives of ECAMP are to:

1. Establish the use of environmental compliance assessments as a means of ensuring the USAF's compliance with all applicable local, DOD, and USAF environmental laws and regulations.

2. Assure major commands, installation commanders, environmental protection committees, environmental coordinators, bioenvironmental engineers, and natural resource managers that their environmental programs are effectively addressing environmental problems that could:

   a. Affect mission effectiveness;

   b. Jeopardize the health of USAF personnel or the general public;

   c. Significantly degrade the environment;

   d. Expose the USAF and its people to avoidable financial liabilities as a result of non-compliance with environmental requirements;

   e. Erode public confidence in the USAF and the defense establishment; and

   f. Expose individuals to civil and criminal liability.

3. Secure information that will permit installation commanders to anticipate and prevent future environmental problems;

4. Enhance management by establishing a system for environmental compliance management;

5. Provide data for use in identifying, programming, and budgeting environmental requirements;

6. Provide accurate and complete information to the public on the status of installation environmental compliance programs; and

7. Provide training and experience to Command personnel.

In addition to the ECAMP inspections, several individual groups already exist within the EM group that will play a role in maintaining compliance with storm water regulations. The spill response coordinator is responsible for implementing the Basewide spill plan. This plan will be maintained by the Wastewater Working group, who is responsible for the Base NPDES Permit Program. The EM group also maintains a pollution prevention program, which is responsible for assessing and implementing waste reduction and hazardous material substitution programs as mandated by USAF command. A pollution prevention directive has been issued and implemented at all USAF bases worldwide.

The Base CE group will be responsible for monitoring on-Base contractors, including erosion control requirements for construction activities. The CE group currently has an inspection program to verify that all contractor activities are conducted in accordance with all applicable regulations. It will be the responsibility of each contractor to comply with erosion control requirements of the WPAFB "Construction Contractor Basic Specifications."

The EM group maintains a communications post which has the capability to distribute vital environmental information through several mechanisms. These mechanisms include: access to the Base newspaper (Skywriter), news releases to the general public when necessary, and direct mailings or distribution of fact sheets to building managers or affected individuals. A newsletter entitled "Environmental Messages" is also distributed Basewide on a periodic basis (approximately four to six times per year).

Additional storm water inspection and reporting activities will focus on airway and aircraft de-icing practices at WPAFB. Beginning with the 1994/1995 de-icing season, procedures for de-icing practices at WPAFB will be incorporated as an addendum to the SWMP. Monitoring of de-icing practices will include:

- Weekly inspection of de-icing activities during the cold weather season.
- A set of follow-up procedures will be used to insure appropriate actions are taken in response to the inspections.
- Records of inspections shall be maintained.

- The types of de-icing compounds (including the MSDS) in use each season will be recorded.

- Monthly quantities of all de-icing compounds used will be recorded.

- Estimates of annual pollutant loadings resulting from discharges of spent de-icing chemicals will be prepared as required by the USAF Group Permit.

Preparation and implementation of the monitoring program for de-icing practices will be directed by the Wastewater Program Manager (645ABW/EM) in consultation with representatives of CE (airway de-icing services) and 645 LOG/LGMT (aircraft de-icing services).

OUTFALL MONITORING PROGRAM

Based on USEPA guidance, WPAFB will conduct a monitoring program to determine the storm water discharge characteristics at selected outfalls. This program will supplement other water monitoring which is currently being conducted under the Basewide Surface Water Monitoring Program (BSW), which is part of the IRP. The BSW is designed to implement a long-term Basewide groundwater and surface water sampling network to:

- Characterize current groundwater and surface water quality.

- Describe water quality changes as water enters, flows across, and exits Base boundaries.

- Conduct statistical analyses of water quality.

- Estimate the effect of WPAFB on regional water quality.

The BSW consists of groundwater, surface water, and sediment samples collected from locations which are hydraulically upgradient, interior, or downgradient from the Base, on the basis of the current regional USGS study. Groundwater samples will be collected during three sampling periods (rounds) per year. Surface water samples will be collected four times per year and sediment samples will be collected once per year. Sampling locations will be on and off-Base as necessary to define Basewide water quality and its relation to the water quality of the immediately surrounding area. Existing USGS, IRP, and planned new wells on and off the Base, are included in the BSW.

The BSW is being completed in addition to the NPDES sampling program. The existing NPDES permit requires monthly sampling for certain compounds at six outlet

points Basewide. Samples are collected on the specified date each month, if flow is present at the outlet. The sampling is intended to monitor a variety of discharge points on-Base and it is not designed as a storm water monitoring program.

OUTFALL SAMPLING AND ANALYSIS PLAN

The storm water outfalls shown in Table 6.1 will be used to monitor the storm water discharge from WPAFB. The selected outfalls are representative of the total discharges for the Base and include the areas where contaminants may potentially occur.

The Storm Water Sampling Program for WPAFB will include sampling from six different outfalls. These outfalls are: Outfall 3, Outfall 5, Outfall 12, Outfall 17, Outfall 18, and Outfall 19. Outfall 3 was selected since it is the most representative of the high concentration of research facilities in Area B. Outfalls 5 and 12 were selected since both of these outfalls have coal pile activity. Outfall 17 was selected since it has runway activity (de-icing) and is similar to Outfalls 15 and 16. Outfall 17 is much easier to sample than either Outfall 15 or 16. Outfall 18 has aircraft activity (refueling and de-icing) and is similar to activities associated with Outfall 14. Outfall 18 is much easier to sample than Outfall 14. Outfall 19 has aircraft maintenance activity. Outfall 19 is similar to activity associated with Outfalls 13 and 14, but Outfall 19 was selected because it is much easier to sample than either Outfall 13 or Outfall 14. The storm water sampling sites for WPAFB are shown in Table 6.1.

Sampling is to be performed once annually for each parameter in a fashion which meets storm event sampling criteria. Sampling for de-icer compounds will be conducted during the season of use (November through March) while sampling for all other parameters can be conducted any time during the year.

Chemicals that might be present in the each of the outfalls due to accidental releases, malfunctions and normal operating procedures are presented in Table 6.2. The list of chemicals is only a first attempt at defining what may be found in each of the outfalls. The chemical list was developed by determining the activity in each outfall area, the type of chemicals stored, and type of accidental releases. The only way to ensure that no chemicals have been left off the list is to test for all chemicals that appear on Tables 2F-2, 2F-3, and 2F-4 of the USEPA NPDES permit application form. However, testing would be very expensive and would not be very cost effective. Another alternative would be to test for chemicals and other substances that appear on OEPA's general NPDES permit. Table 6.3 lists all substances that appear on OEPA's general NPDES permit.

TABLE 6.1

STORM WATER SAMPLING PROGRAM

OUTFALL	AREA DESCRIPTION	PARAMETERS
3	LARGEST CONCENTRATION OF BUILDINGS IN RESEARCH & DEVELOPMENT AREA	OIL & GREASE, BOD_5, COD, TSS, PH, IRON, CADMIUM, CHROMIUM, COPPER, LEAD, ARSENIC
5	BOILER PLANT AREA AND COAL PILE RUNOFF	OIL & GREASE, TSS, PH, COPPER, NICKEL, ZINC, IRON
12	BOILER PLANT AREA AND COAL PILE RUNOFF	OIL & GREASE, TSS, PH, COPPER, NICKEL, ZINC, IRON
17	AIRWAY AND FUEL STORAGE AREAS	OIL & GREASE, BOD_5, COD, TSS, PH AND DE-ICERS (PROPYLENE GLYCOL AND POTASSIUM ACETATE)
18	FLIGHT MAINTENANCE AREAS	OIL & GREASE, BOD_5, COD, TSS, PH AND DE-ICER (PROPYLENE GLYCOL)
19	FLIGHT MAINTENANCE AREAS	OIL & GREASE, BOD_5, COD, TSS, PH AND DE-ICER (PROPYLENE GLYCOL)

TABLE 6.2

CHEMICALS POTENTIALLY PRESENT IN STORM WATER DISCHARGES

OUTFALL	AREA DESCRIPTION	PARAMETERS
1	AIR FORCE MUSEUM, DEACTIVATED NUCLEAR REACTOR, HAZARDOUS WASTE TREATMENT AND STORAGE FACILITY	OIL & GREASE, BOD_5, COD, TSS, PH, METHYLENE CHLORIDE, 2-BUTANONE (MEK), BENZENE, TOLUENE, ETHYLBENZENE, STYRENE, XYLENES, IRON, 1,1,1-TRICHLOROETHANE, RADIOACTIVITY
2	WRIGHT FIELD RUNWAY	OIL & GREASE, BOD_5, COD, TSS, PH, IRON
3	LARGEST CONCENTRATION OF BUILDINGS IN RESEARCH & DEVELOPMENT AREA	OIL & GREASE, BOD_5, COD, TSS, PH, METHYLENE CHLORIDE, 2-BUTANONE (MEK), BENZENE, TOLUENE, ETHYLBENZENE, STYRENE, XYLENES, IRON, 1,1,1-TRICHLOROETHANE, CADMIUM, CHROMIUM, COPPER, LEAD, NICKEL, SILVER, ZINC
4	LARGE CONCENTRATION OF BUILDINGS IN RESEARCH AND DEVELOPMENT AREA	OIL & GREASE, BOD_5, COD, TSS, PH, METHYLENE CHLORIDE, 2-BUTANONE (MEK), BENZENE, TOLUENE, ETHYLBENZENE, STYRENE, XYLENES, IRON, 1,1,1-TRICHLOROETHANE, PHENOLS
5	BOILER PLANT AREA AND COAL PILE RUNOFF	OIL & GREASE, TSS, PH, COPPER, NICKEL, ZINC, PHENOLS, IRON, SULFATE, BENZENE, TOLUENE, ETHYLBENZENE, STYRENE, XYLENES
6	ENTOMOLOGY (PATTERSON FIELD, AREA A)	OIL & GREASE, BOD_5, COD, TSS, PH, METHYLENE CHLORIDE, 2-BUTANONE (MEK), BENZENE, TOLUENE, ETHYLBENZENE, STYRENE, XYLENES, 1,1,1-TRICHLOROETHANE, NAPHTHALENE, CARBARYL, 2,4-D
7	PAVEMENT AND GROUNDS FACILITY	OIL & GREASE, BOD_5, COD, TSS, PH, BENZENE, TOLUENE, ETHYLBENZENE, STYRENE, XYLENES, IRON, SILVER
8	ADMINISTRATIVE FACILITIES	OIL & GREASE, BOD_5, COD, TSS, PH, BENZENE, TOLUENE, ETHYLBENZENE, STYRENE, XYLENES, IRON
9	ADMINISTRATIVE FACILITIES	OIL & GREASE, BOD_5, COD, TSS, PH, BENZENE, TOLUENE, ETHYLBENZENE, STYRENE, XYLENES, IRON
10	ADMINISTRATIVE FACILITIES	OIL & GREASE, BOD_5, COD, TSS, PH, BENZENE, TOLUENE, ETHYLBENZENE, STYRENE, XYLENES

TABLE 6.2 (Continued)

OUTFALL	AREA DESCRIPTION	PARAMETERS
11	ADMINISTRATIVE FACILITIES	OIL & GREASE, BOD_5, COD, TSS, PH, BENZENE, TOLUENE, ETHYLBENZENE, STYRENE, XYLENES, IRON
12	BOILER PLANT AREA AND COAL PILE RUNOFF	OIL & GREASE, TSS, PH, COPPER, NICKEL, ZINC, METHYLENE CHLORIDE, 2-BUTANONE (MEK), BENZENE, TOLUENE, ETHYLBENZENE, STYRENE, XYLENES, 1,1,1-TRICHLOROETHANE, PROPYLENE GLYCOL, IRON
13	FLIGHT SUPPORT SHOPS - EAST AREA	OIL & GREASE, BOD_5, COD, TSS, PH, DE-ICERS (PROPYLENE GLYCOL AND POTASSIUM ACETATE), BENZENE, TOLUENE, ETHYLBENZENE, STYRENE, XYLENES, COPPER, LEAD, SULFATE
14	AIRWAY AND FUEL STORAGE AREAS	OIL & GREASE, BOD_5, COD, TSS, PH AND DE-ICERS (PROPYLENE GLYCOL AND POTASSIUM ACETATE), BENZENE, TOLUENE, ETHYLBENZENE, STYRENE, XYLENES
15	AIRWAY AND FUEL STORAGE AREAS	OIL & GREASE, BOD_5, COD, TSS, PH AND DE-ICERS (PROPYLENE GLYCOL AND POTASSIUM ACETATE), BENZENE, TOLUENE, ETHYLBENZENE, STYRENE, XYLENES
16	AIRWAY AND FUEL STORAGE AREAS	OIL & GREASE, BOD_5, COD, TSS, PH AND DE-ICERS (PROPYLENE GLYCOL AND POTASSIUM ACETATE), BENZENE, TOLUENE, ETHYLBENZENE, STYRENE, XYLENES
17	AIRWAY AND FUEL STORAGE AREAS	OIL & GREASE, BOD_5, COD, TSS, PH AND DE-ICERS (PROPYLENE GLYCOL AND POTASSIUM ACETATE), BENZENE, TOLUENE, ETHYLBENZENE, STYRENE, XYLENES, METHYLENE CHLORIDE, 2-BUTANONE (MEK), 1,1,1-TRICHLOROETHANE
18	FLIGHT MAINTENANCE AREAS	OIL & GREASE, BOD_5, COD, TSS, PH AND DE-ICER (PROPYLENE GLYCOL), BENZENE, TOLUENE, ETHYLBENZENE, STYRENE, XYLENES
19	FLIGHT MAINTENANCE AREAS	OIL & GREASE, BOD_5, COD, TSS, PH AND DE-ICER (PROPYLENE GLYCOL), BENZENE, TOLUENE, ETHYLBENZENE, STYRENE, XYLENES
20	FLIGHT MAINTENANCE AREAS	OIL & GREASE, BOD_5, COD, TSS, PH, BENZENE, TOLUENE, ETHYLBENZENE, STYRENE, XYLENES, IRON

TABLE 6.3

ALTERNATIVE STORM WATER MONITORING REQUIREMENTS
SUBSTANCES LISTED ON OHIO GENERAL NPDES PERMIT

PARAMETER
OIL AND GREASE
BIOCHEMICAL OXYGEN DEMAND (BOD_5)
CHEMICAL OXYGEN DEMAND (COD)
TOTAL SUSPENDED SOLIDS (TSS)
TOTAL KJELDAHL NITROGEN
PHOSPHORUS
PH
ACUTE TOXICITY
NITRATE-NITROGEN
NITRITE-NITROGEN
LEAD, TOTAL
CADMIUM, TOTAL
COPPER, TOTAL
ARSENIC, TOTAL
CHROMIUM, TOTAL
AMMONIA
MAGNESIUM, TOTAL
MAGNESIUM, DISS.
TOTAL DISSOLVED SOLIDS
TOTAL ORGANIC CARBON
BARIUM, TOTAL
CYANIDE, TOTAL
MERCURY, TOTAL
SELENIUM, TOTAL
SILVER, TOTAL
PENTACHLOROPHENOL
NICKEL, TOTAL
ZINC, TOTAL
FECAL COLIFORM

The WPAFB Basewide Surface Water Monitoring Program (BSW) included sites located near Outfall Areas 4, 5, 12 and 13, 14 and 15, 16, and 17 through 19. Table 6.4 lists the sites located near the storm water outfalls which were tested during the first round of the BSW.

Water at these sites was tested for semi-volatile organics, pesticides, volatile organics, cyanide, bromide, chloride, nitrogen, sulfate, total petroleum hydrocarbons, chlorinated herbicides, radiation, total metals, and dissolved metals. The substances tested for in the surface water included almost all of the substances found on Table 2F-2 and Table 2F-3, and some of the substances listed on Table 2F-4. The results of the BSW indicate that most of the substances tested for were below the detection limit. However, some organic compounds, metals and other pollutants were found at very low levels. These pollutants include: butyl benzyl phthalate, dibromochloromethane, methylene chloride, chloride, nitrogen (nitrate), sulfate, radiation, aluminum, antimony, arsenic, barium, calcium, chromium, copper, iron, lead, magnesium, manganese, selenium, vanadium, and zinc. Results from the ongoing BSW would be a good basis for identifying additional chemicals to be included on the sampling list. Finally, monthly sampling records collected for the existing NPDES permit at WPAFB indicate those substances (TSS, iron) which are encountered in significant quantities in discharges from the Base. The sampling records are summarized in Table 6.5 and these results have been incorporated in the design of the Storm Water Sampling Program for WPAFB.

TABLE 6.4

USGS SURFACE WATER SAMPLING POINTS

USGS SURFACE WATER SAMPLING POINTS	STORM WATER OUTFALL(S)
DGS-5, DGS-7	14 AND 15
DGS-8	16
INTS-6	5
INTS-13	6 THROUGH 12, AND 13
INTS-15	12 AND 13
NPDES-3	4
NPDES-5	17, 18 AND 19

TABLE 6.5

SUMMARY OF NONCOMPLIANCE FROM NPDES DISCHARGE POINTS

Date	Discharge Point	Pollutants											
		Total Suspended Solids				Iron				Copper			
		Concentration (mg/L)		Quantity (kg/D)		Concentration (mg/L)		Quantity (kg/D)		Concentration (mg/L)		Quantity (kg/D)	
		Monthly Average (15)*	Max (20)	Monthly Average (14)**	Max (19)**	Monthly Average (0.5)	Max (1.0)	Monthly Average (0.5)	Max (1.0)***	Monthly Average (500)	Max (1000)	Monthly Average (0.5)	Max (1.0)
23 Dec 91	003	67	132	113.7	113.7	2.605	5.21	3.127	3.127	-	-	-	-
	004	1028	1028	11,931.3	11,931.3	27	27	310	310	-	-	-	-
	005	17	-	38	38	-	-	-	-	-	-	-	-
21 Jan 92	001	21	21	-	-	-	-	-	-	-	-	-	-
12 Feb 92	001	64	64	61	61	-	-	-	-	-	-	-	-
9 Mar 92	002	25	25	-	-	-	-	-	-	-	-	-	-
	004	-	-	-	-	-	-	0.6	-	-	-	-	-
6 Apr 92	003	31	62	59.1	59.1	1.36	3.04	2.9	2.9	-	-	-	-
11 May 92	002	28	28	-	-	-	-	-	-	-	-	-	-
	003	50	100	92.1	92.1	1.645	3.190	2.94	2.94	-	-	-	-
18 Jun 92	004	33	51	257	388	1.41	2.41	10.8	17.96	-	-	-	-
20 Jul 92	003	25.5	49	44.1	44.1	0.560	1.120	1.029	1.029	-	-	-	-
11 Aug 92	002	63	63	26.1	26.1	-	-	-	-	-	-	-	-
24 Aug 92	003	-	-	14.8	-	0.560	1.010	0.9	-	698.5	1170	1.116	1.116
14 Oct 92	004	-	-	28.4	28.4	-	-	-	-	-	-	-	-

TABLE 6.5 (Continued)

Date	Discharge Point	Pollutants											
		Total Suspended Solids				Iron				Copper			
		Concentration (mg/L)		Quantity (kg/D)		Concentration (mg/L)		Quantity (kg/D)		Concentration (mg/L)		Quantity (kg/D)	
		Monthly Average (15)*	Max (20)	Monthly Average (14)**	Max (19)**	Monthly Average (0.5)	Max (1.0)	Monthly Average (0.5)	Max (1.0)***	Monthly Average (500)	Max (1000)	Monthly Average (0.5)	Max (1.0)
13 Nov 92	002	36	36	14.9	15.5	-	-	-	-	-	-	-	-
	004	18	-	71.2	71.2	1.1	1.1	10.14	10.14	-	-	-	-
	005	17	-	37.97	37.97	-	-	-	-	-	-	-	-
20 Nov 92	003	-	21	18.9	-	0.705	-	0.883	-	-	-	-	-
12 Jan 93	004	-	-	-	-	0.68	-	-	-	-	-	-	-
	005	-	-	15.6	15.6	-	-	-	-	-	-	-	-
26 Jan 93	003	45	79	28.5	51.3	3.15	3.6	2.26	2.37	-	-	-	-
5 Feb 93	004	-	-	23	23.4	-	-	1.64	1.64	-	-	-	-
5 Feb 93	005	-	-	17.9	17.9	-	-	-	-	-	-	-	-
12 Feb 93	002	41	41	17	17	-	-	-	-	-	-	-	-
23 Feb 93	003	17.5	22	16.7	21	0.56	-	-	-	-	-	-	-
12 Mar 93	004	-	-	23.4	23.4	-	-	2.34	2.34	-	-	-	-
30 Mar 93	003	41.5	55	39.6	52.5	1.55	1.8	1.48	1.72	-	-	-	-
7 Apr 93	002	280	280	116	116	-	-	-	-	-	-	-	-
	003	17.5	22	16.7	21	-	-	-	-	-	-	-	-
	004	16	187	24.6	187	-	-	1.4	1.4	-	-	-	-
	005	-	-	-	24.6	-	-	-	-	-	-	-	-

TABLE 6.5 (Continued)

Date	Discharge Point	Pollutants											
		Total Suspended Solids				Iron				Copper			
		Concentration (mg/L)		Quantity (kg/D)		Concentration (mg/L)		Quantity (kg/D)		Concentration (mg/L)		Quantity (kg/D)	
		Monthly Average (15)*	Max (20)	Monthly Average (14)**	Max (19)**	Monthly Average (0.5)	Max (1.0)	Monthly Average (0.5)	Max (1.0)***	Monthly Average (500)	Max (1000)	Monthly Average (0.5)	Max (1.0)
7 May 93	002	22	22	9.1	-	-	-	-	-	-	-	-	-
	004	-	-	-	23.4	-	-	0.8	-	-	-	-	-
15 Jun 93	002	22	22	9.1	-	-	-	-	-	-	-	-	-
	004	-	-	58.5	58.5	-	-	-	-	-	-	-	-
	005	-	-	13.4	13.4	-	-	-	-	-	-	-	-
16 Jul 93	004	-	-	-	-	-	-	1.29	1.29	-	-	-	-
19 Jul 93	003	61	119	58.2	113.5	2.54	5.0	2.42	4.77	-	-	-	-
13 Aug 93	002	125	125	51.8	51.8	-	-	-	-	-	-	-	-
	004	-	-	-	-	-	-	0.94	-	-	-	-	-
8 Sept 93	002	102	102	42.2	42.2	-	-	-	-	-	-	-	-
	004	-	-	-	-	-	-	0.585	-	-	-	-	-

*Numbers in () refer to permitted average or monthly quantities of pollutants.
**Permitted average quantity of Suspended Solids is 8.5 kg/d and maximum quantity of Suspended Solids is 11.5 kg/d for discharge points 002 and 005 commencing 1 Jan 93.
Permitted average quantity of Suspended Solids is 17 kg/d and maximum quantity of Suspended Solids is 22 kg/d for discharge point 004 commencing 1 Jan 93.
***Permitted maximum quantity of iron is 1.1 kg/D for discharge point 004 commencing 1 Jan 93.

APPENDIX A

NON-STORM WATER DISCHARGE ASSESSMENT AND CERTIFICATION SHEETS

NON-STORM WATER DISCHARGE ASSESSMENT AND CERTIFICATION

Worksheet #5
Completed by: ______________________
Title: ______________________
Date: ______________________

Date of Test or Evaluation	Outfall Directly Observed During the Test (identify as indicated on the site map)	Method Used to Test or Evaluate Discharge	Describe Results from Test for the Presence of Non-Storm Water Discharge	Identify Potential Significant Sources	Name of Person Who Conducted the Test or Evaluation

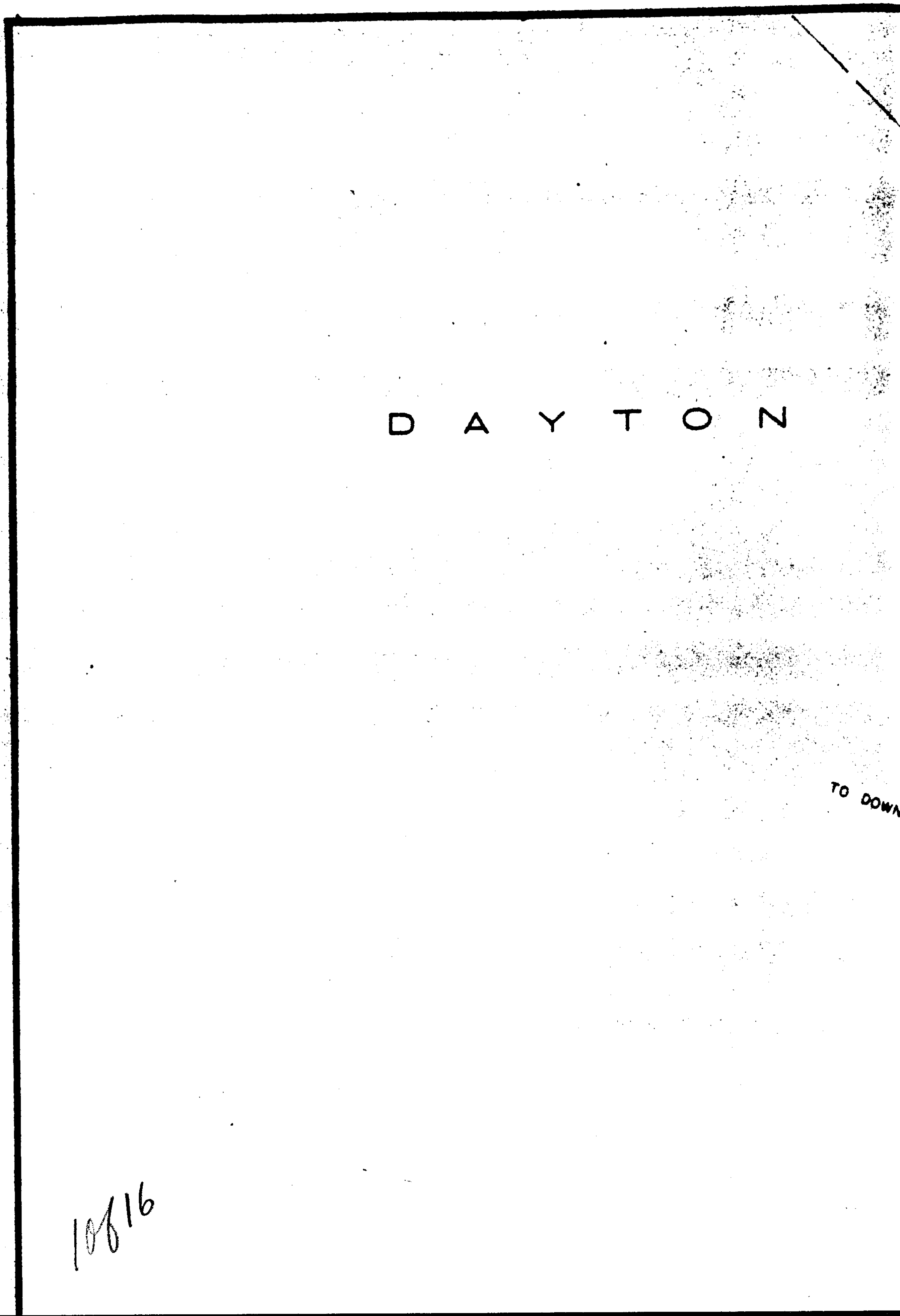
CERTIFICATION

I, ______________________ (responsible corporate official), certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

A. Name & Official Title (type or print)	B. Area Code and Telephone No.
C. Signature	D. Date Signed

APPENDIX B

MAPS OF STORM WATER OUTFALL AREAS AND DRAINAGE REGIONS



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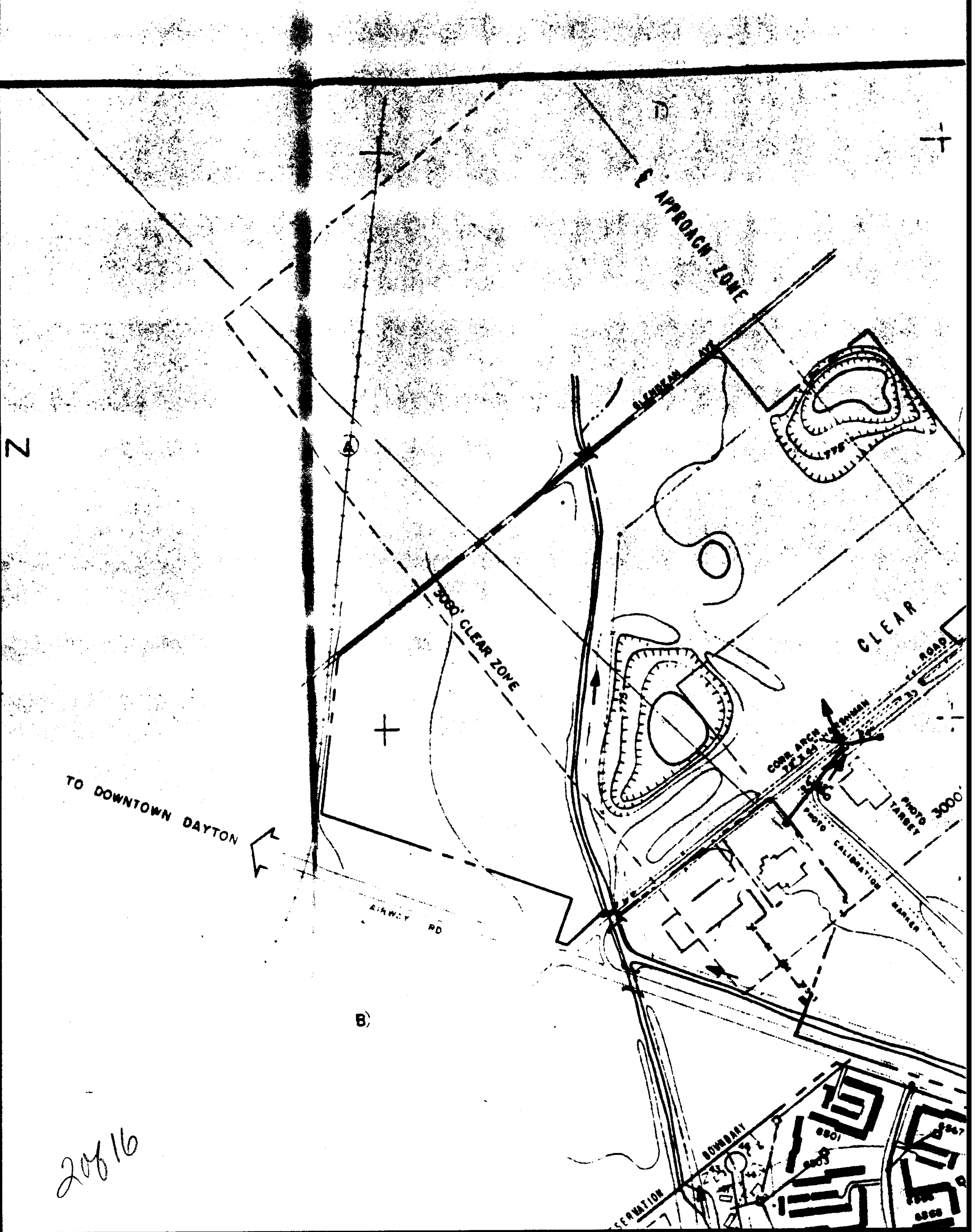
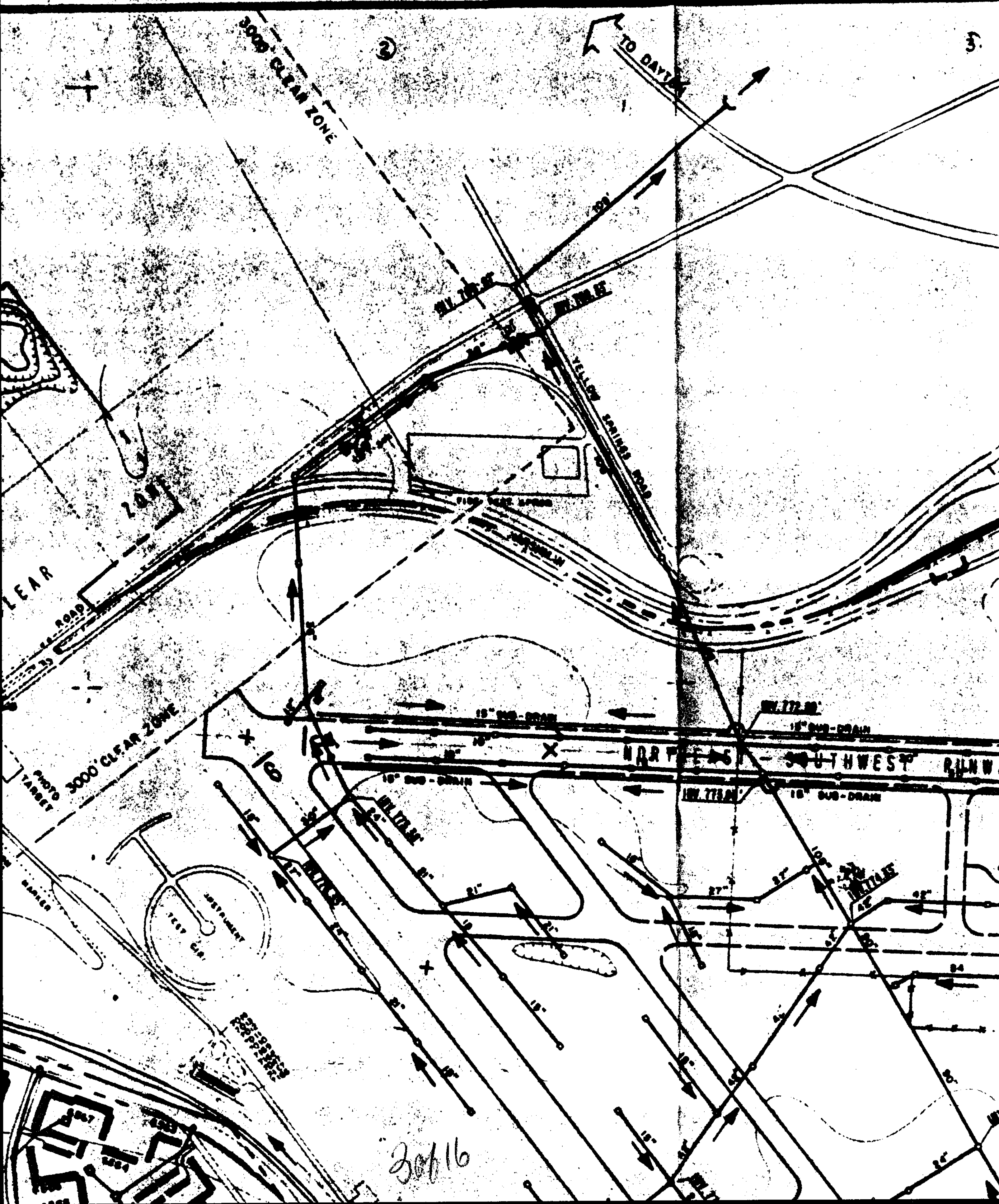
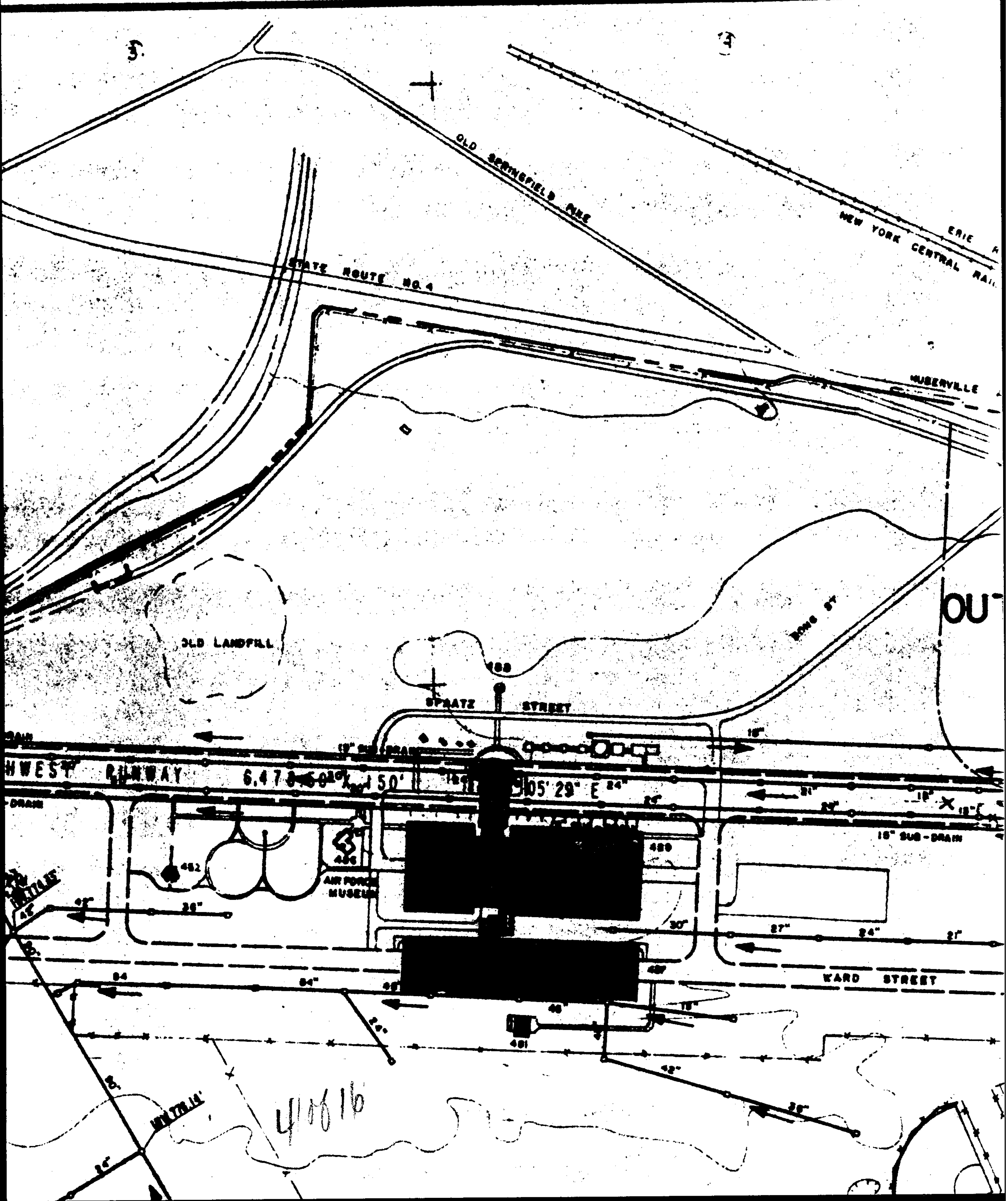
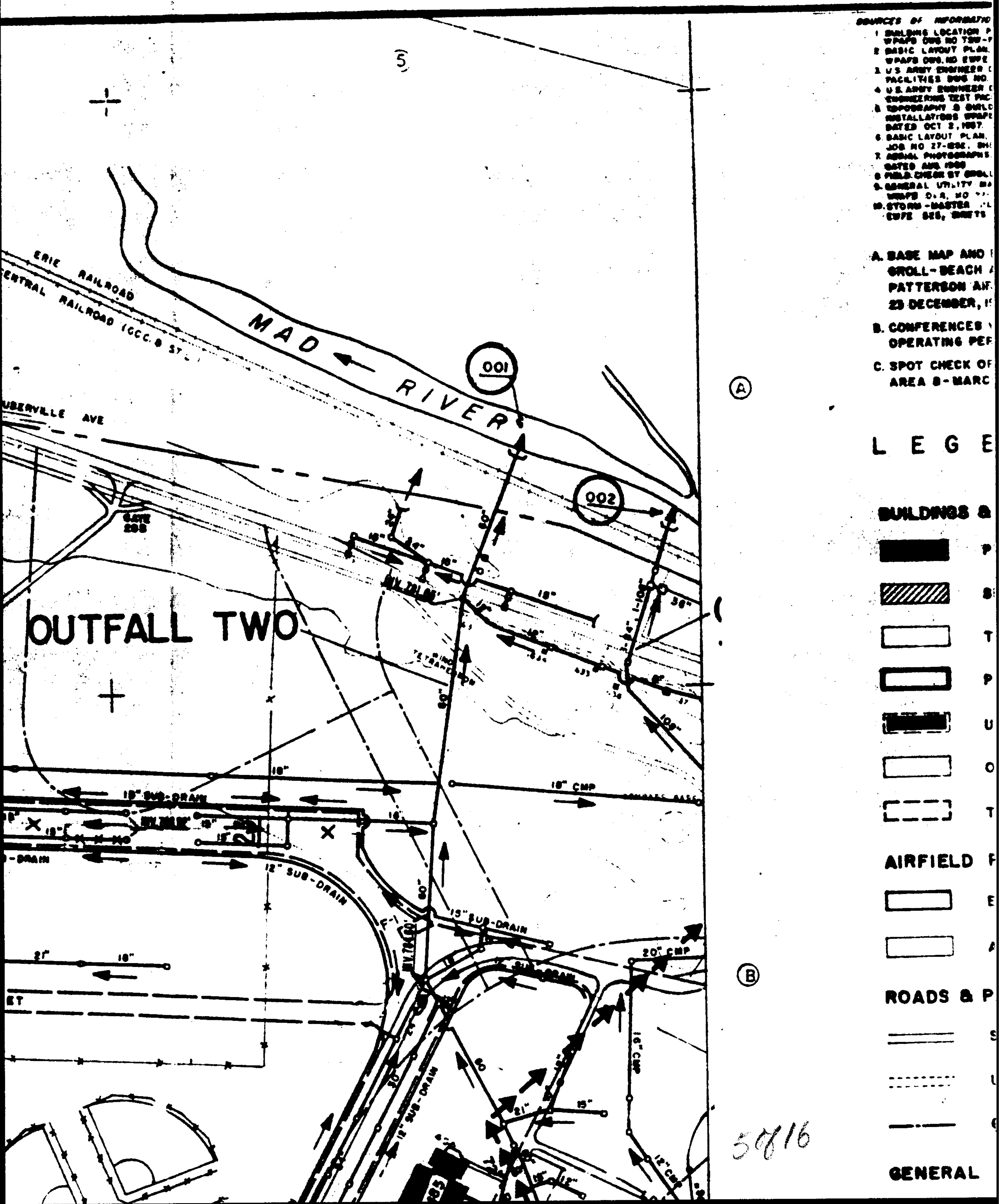

N
APPROACH ZONE
GLENDEAN AVE
3000' CLEAR ZONE
CLEAR
ROAD
CORR. ARCH
PHOTO TARGET
PHOTO CALIBRATION MARKER
3000'
TO DOWNTOWN DAYTON
AIRWAY RD
775
BOUNDARY
RESERVATION
B)
20f16


3000' CLEAR ZONE
TO DAYTON
YELLOW SPRINGS ROAD
15" SUB-DRAIN
15" SUB-DRAIN
15" SUB-DRAIN
NORTHEAST - SOUTHWEST RUNWA
3000' CLEAR ZONE
PHOTO TARGET
TEST CIR.
INSTRUMENT
MARKER

30f16

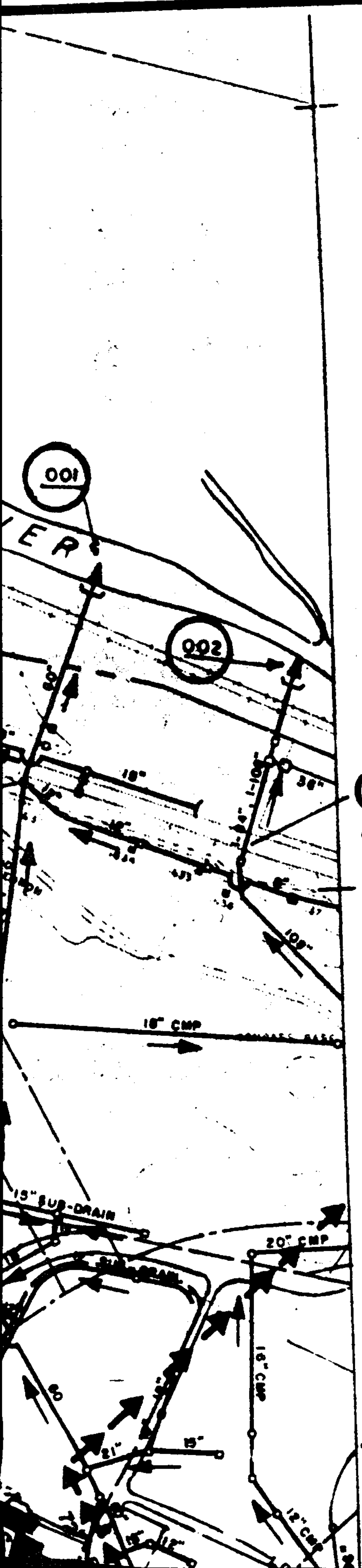
L USE ONLY (AFR 11-30)





5
ERIE RAILROAD
MAD RIVER
001
002
OUTFALL TWO
GATE 28B
18" SUB-DRAIN
12" SUB-DRAIN
15" SUB-DRAIN
18" CMP
20" CMP
16" CMP
Ⓐ
Ⓑ
A. BASE MAP AND
GROLL-BEACH
PATTERSON AI
23 DECEMBER,
B. CONFERENCES
OPERATING PE
C. SPOT CHECK OF
AREA 8-MARC
L E G E
BUILDINGS &
AIRFIELD
ROADS & P
GENERAL

5816



SOURCES OF INFORMATION

1. BUILDING LOCATION PLAN, AREAS A, B & C, AIR INSTALLATIONS WPAFB DWG NO TSW-PF-150, SHEET D, DATED FEB 10, 1957
2. BASIC LAYOUT PLAN, AREAS A, B, C & D, AIR INSTALLATIONS WPAFB DWG. NO EWPE-150, SHEET K, DATED APRIL 1, 1956
3. U S ARMY ENGINEER DISTRICT, LOUISVILLE, SAC DISPERSAL FACILITIES DWG NO. WPF [illegible], DATED MAY 1956.
4. U S ARMY ENGINEER DISTRICT, LOUISVILLE, NUCLEAR ENGINEERING TEST FACILITIES DWG NO WPF-[illegible], DATED APRIL 1956.
5. TOPOGRAPHY & BUILDING LOCATION PLAN, AREAS A & C, AIR INSTALLATIONS WPAFB DWG NO TSW-PF-150, SHEET K, DATED OCT 2, 1957.
6. BASIC LAYOUT PLAN, AREAS B & D, AIR INSTALLATIONS WPAFB JOB NO 27-1252, SHEET 1 OF 1, DATED OCT. 2, 1957
7. AERIAL PHOTOGRAPHS, AIR INSTALLATIONS, WPAFB DATED AUG. 1956
8. FIELD CHECK BY GROLL-BEACH & ASSOCIATES, JULY & [illegible]
9. GENERAL UTILITY MAPS-STORM SEWER SYSTEM-AREA [illegible] WPAFB D. R. NO [illegible] SHEET NO. 1 THRU 5, DATED JULY [illegible]
10. STORM-MASTER [illegible] PLAN - AREAS A & C, WPAFB DWG. NO. EWPE 525, SHEETS [illegible], DATED JULY [illegible]

(A)

A. BASE MAP AND EXISTING UTILITY LAYOUT ARE FROM GROLL-BEACH AND ASSOCIATES DRAWINGS-WRIGHT PATTERSON AIR FORCE BASE MASTER PLAN DATED 23 DECEMBER, 1969.
B. CONFERENCES WITH DESIGN, MAINTENANCE AND OPERATING PERSONNEL - MARCH - MAY, 1964.
C. SPOT CHECK OF 1" = 20' UTILITY GRID MAPS OF AREA B - MARCH - MAY, 1964.

L E G E N D

BUILDINGS & STRUCTURES

PERMANENT

SEMI-PERMANENT

TEMPORARY

PROPOSED

UNDERGROUND

OTHER THAN MILITARY

TO BE REMOVED

AIRFIELD PAVEMENT

EXISTING

ABANDONED

(B)

ROADS & PARKING

SURFACED

UNIMPROVED

℄ PROPOSED ROADS

6 of 16

GENERAL


FENCE
C
FENCE OR RESERVATION BOUNDARY
PLAYING COURTS
POOLS
240
241
242
229
800
CHESTERFIELD RD
D
SPINNING RD
BARRETT DR

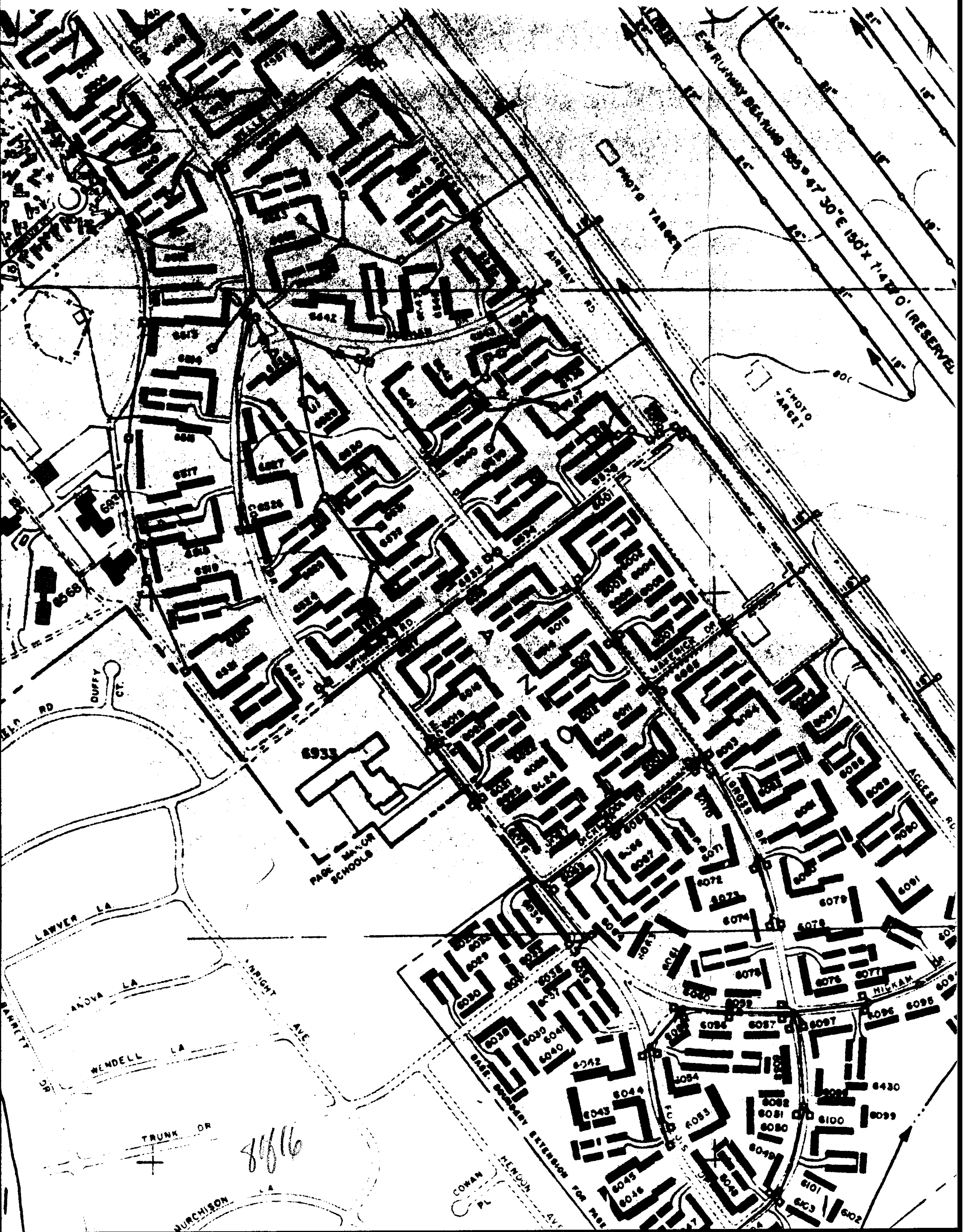
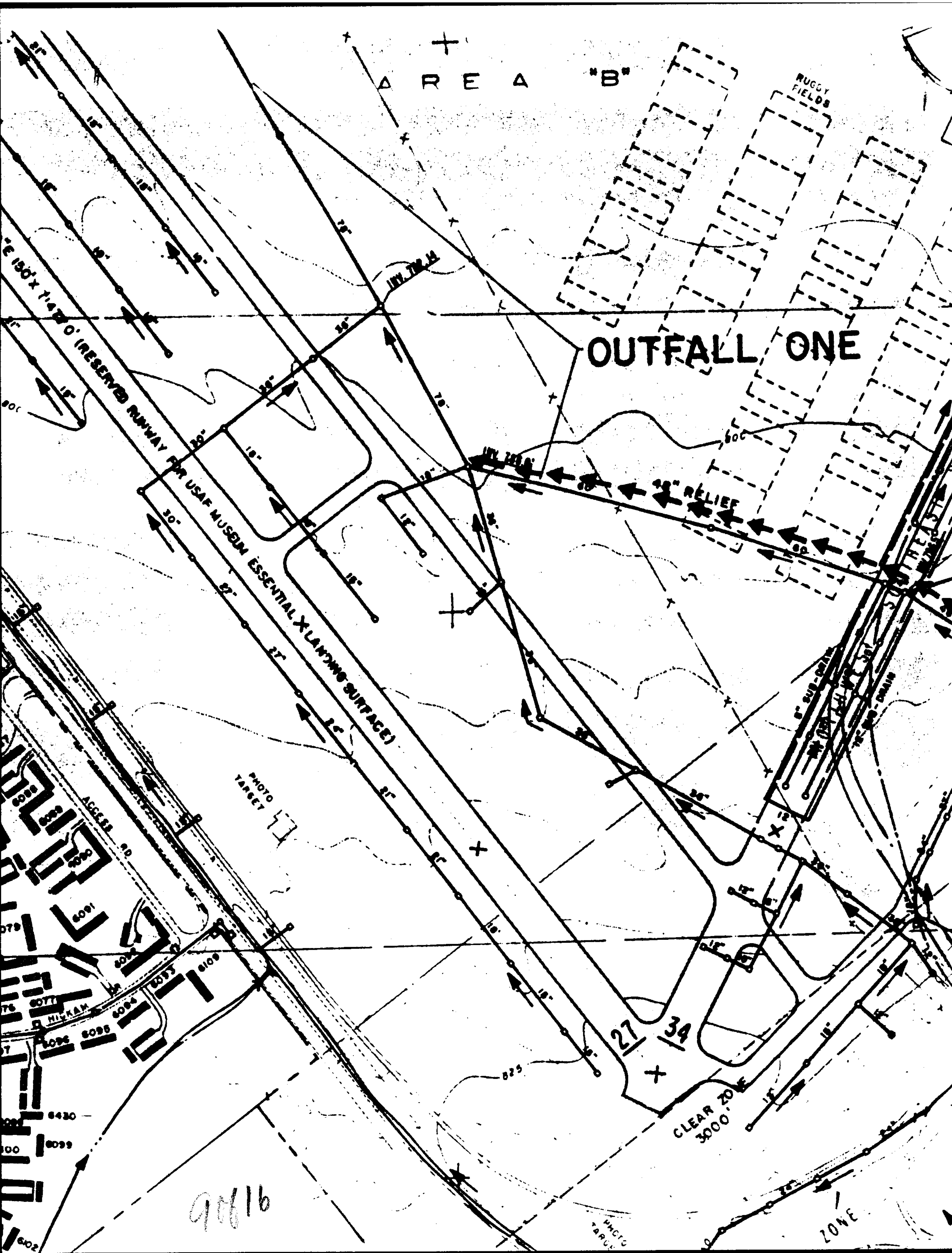
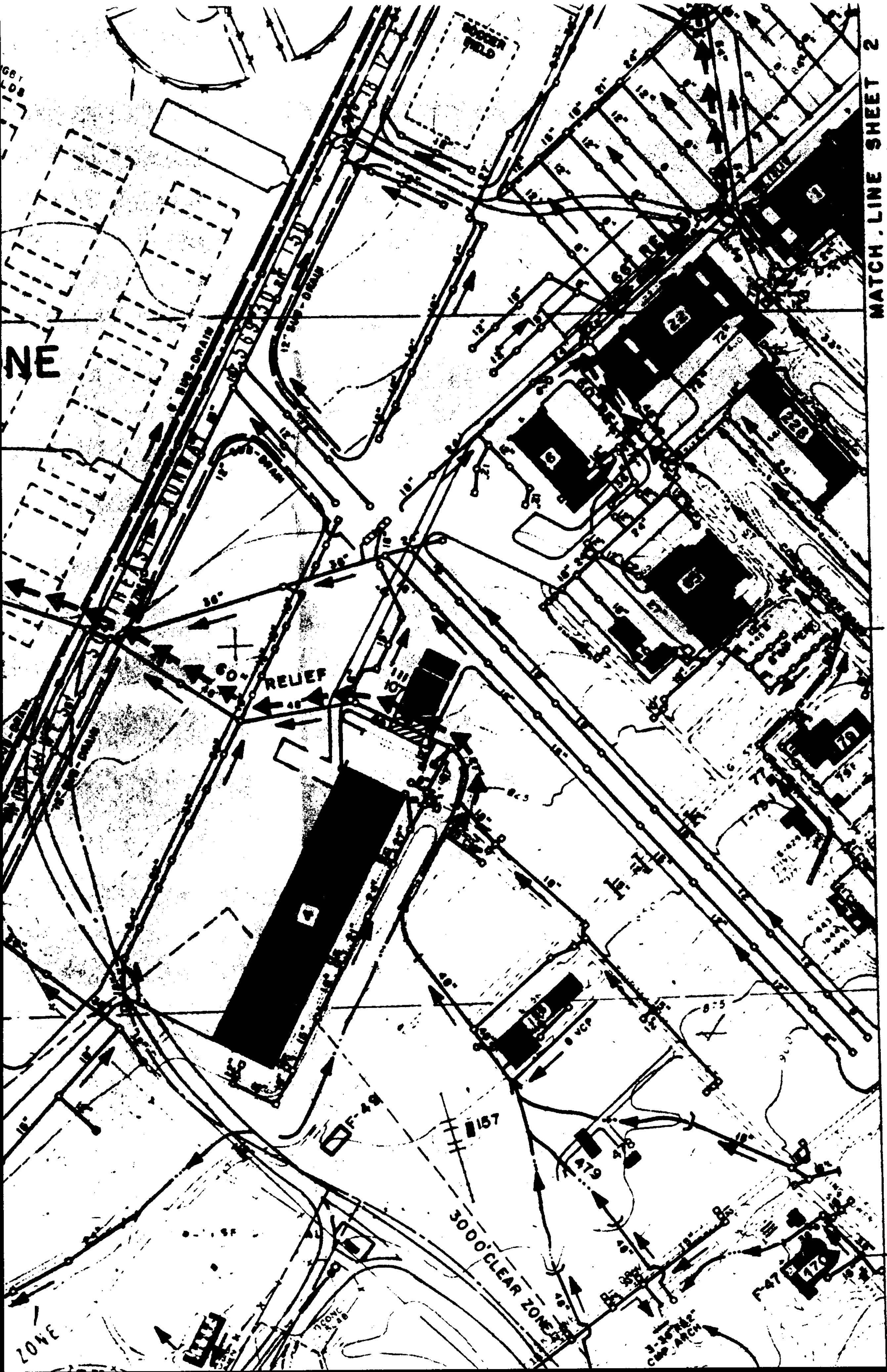


PHOTO TARGET
AIRWAY RD
ACCESS RD
MAVERICK DR
HICKAM
6933
PAGE MANOR SCHOOLS
DUFFY CT
LAWVER LA
ANOVA LA
WENDELL LA
TRUNK DR
MURCHISON LA
COWAN PL
6568
8116


AREA "B"
RUGBY FIELDS
OUTFALL ONE
48" RELIEF
(RESERVED) RUNWAY FOR USAF MUSEUM ESSENTIAL X LANDING SURFACE)
PHOTO TARGET
ACCESS RD
HICKAM
27
34
CLEAR ZONE
3000'
6091
6092
6093
6094
6095
6096
6109
6430
6099
90616



NO

1. A
B

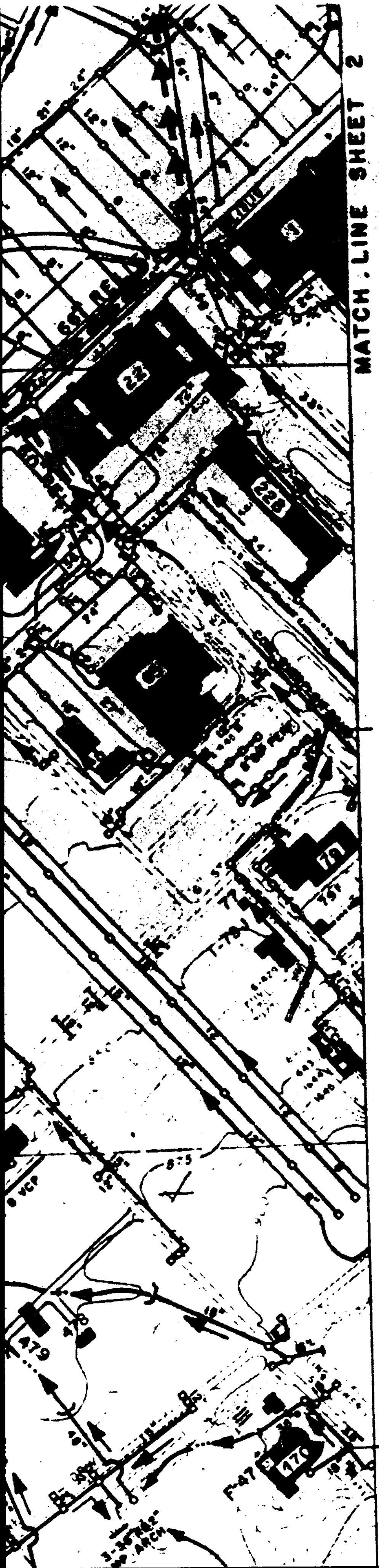
2. P
C
S

3

4.

10 of 16

1



FENCE

RAILROAD

EASEMENT

STORM DRAINAGE SYSTEM

STREAM OR RIVER

BERM OR LEVEE

DRAINAGE DITCH

15" PIPE WITH SIZE

MANHOLE

INV. 796.89' MANHOLE WITH KEY INVERT

CATCH BASIN OR INLET

CULVERT

CONCRETE DRAIN OR PAVED DITCH

FRENCH DRAIN

HEADWALLS

DIRECTION OF FLOW

EXISTING FACILITY TO BE ABANDONED

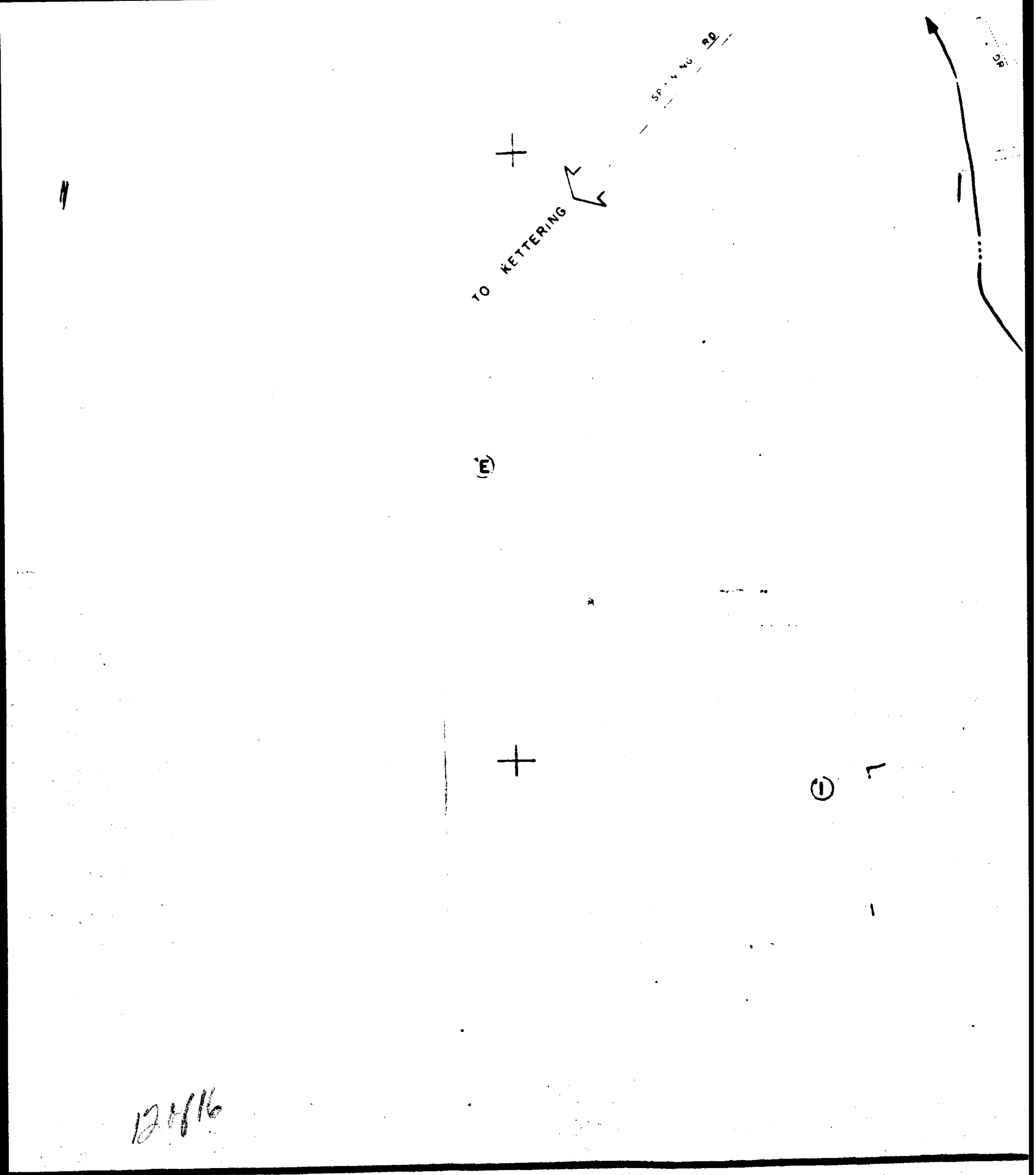
72" PROPOSED STORM SEWER OR CULVERT (WITH SIZE)

NOTES:

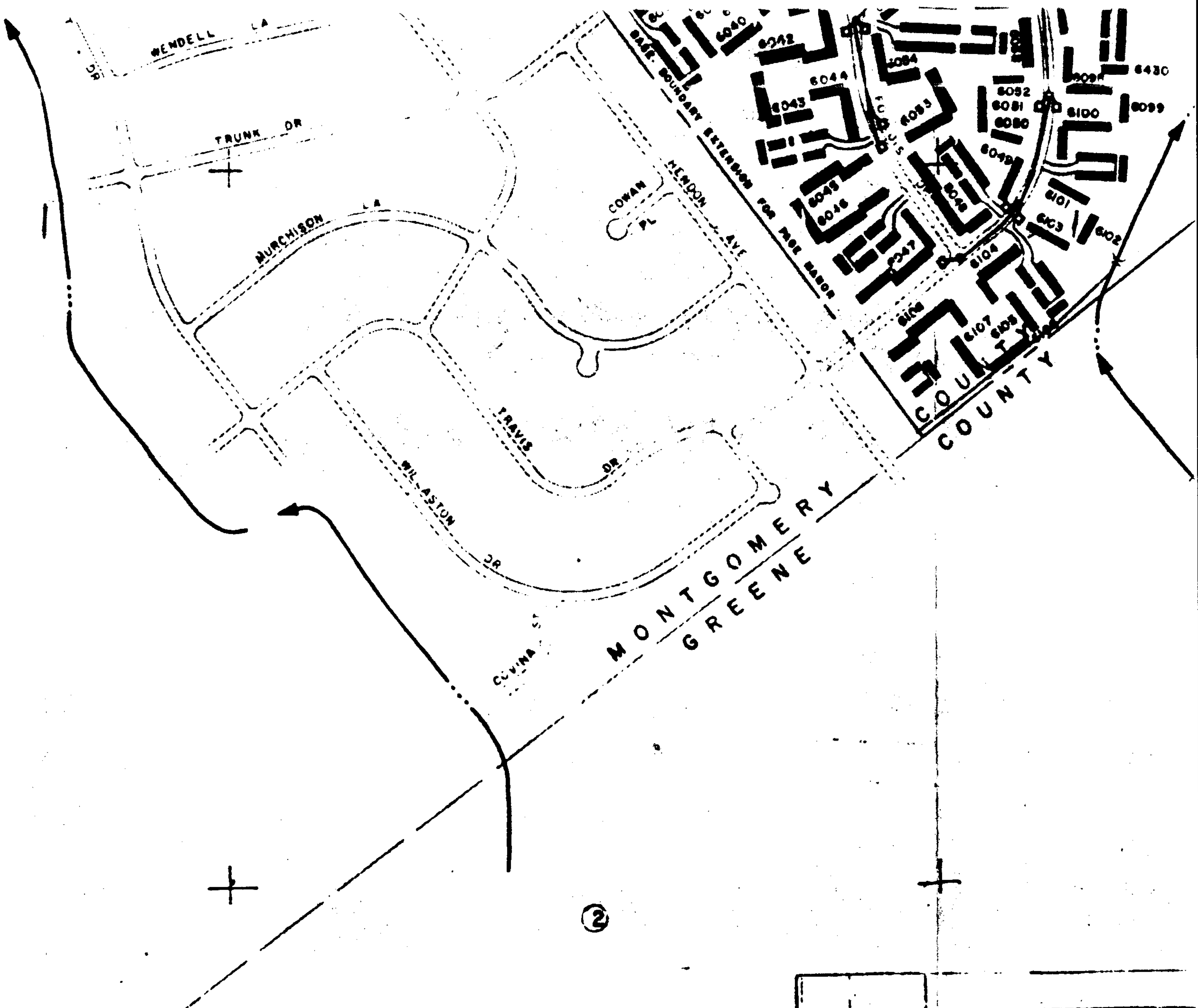
1. ALL PIPE IS CONCRETE UNLESS OTHERWISE NOTED BY: CIP — CAST IRON PIPE
   CMP — CORRUGATED METAL PIPE
   VCP — VETRIFIED CLAY PIPE
2. PROPOSED FACILITIES, BUILDINGS, BUILDING NUMBERS AND CENTERLINE OF ROADS ARE IN ACCORDANCE PROPOSALS SHOWN ON TAB F-1 DATED APRIL, 1965.
3. ALL INFORMATION SHOWN IN AREA "B" WAS PREPARED AS PART OF THE HARLAND BARTHOLOMEW MASTER PLAN CONTRACT DATED APRIL, 1965.
4. NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM SAMPLING POINTS

110f16

1



12/16



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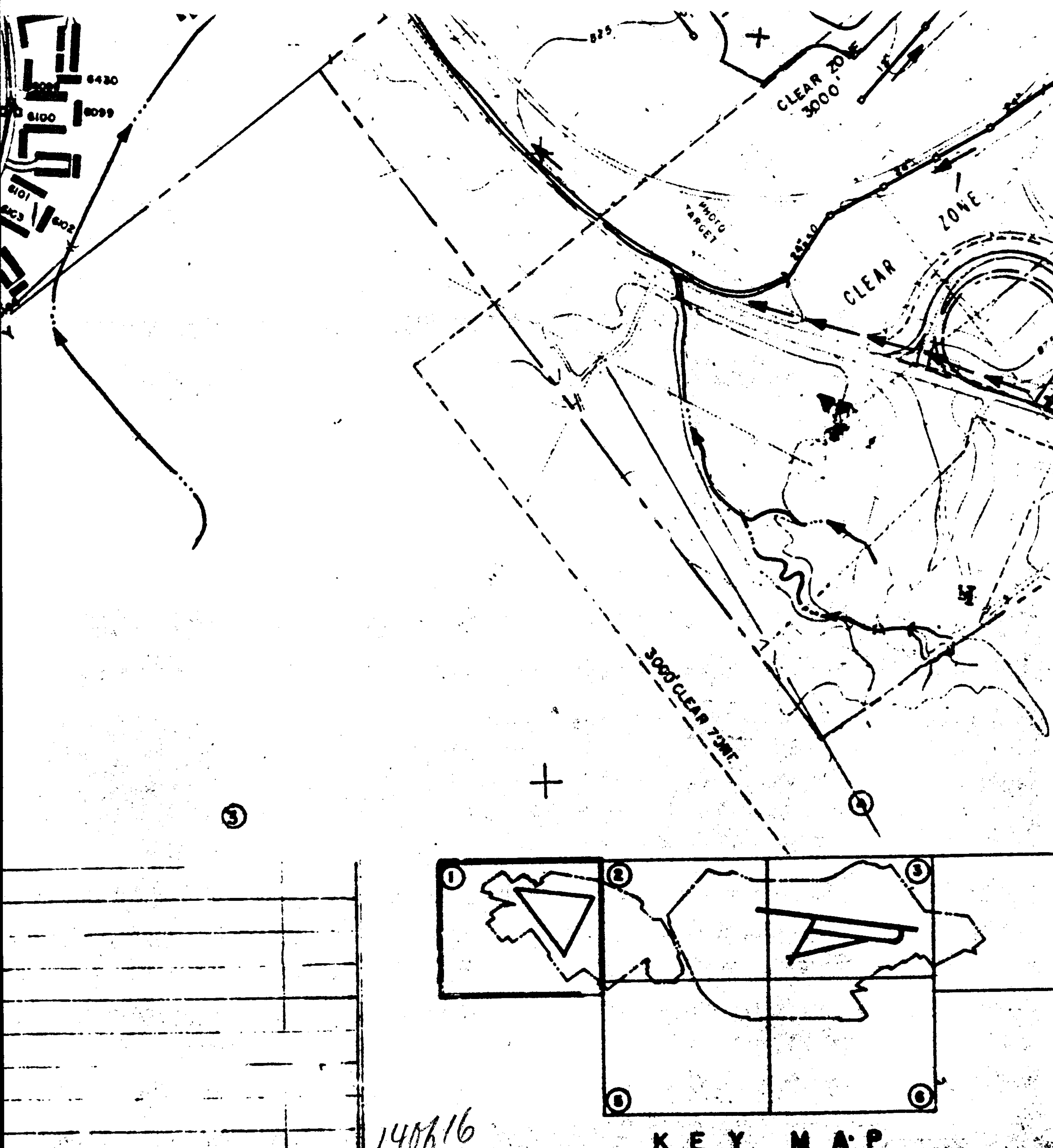
10 7-10-94 ANNUAL REVISION UPDATE

FOR OFFICIAL



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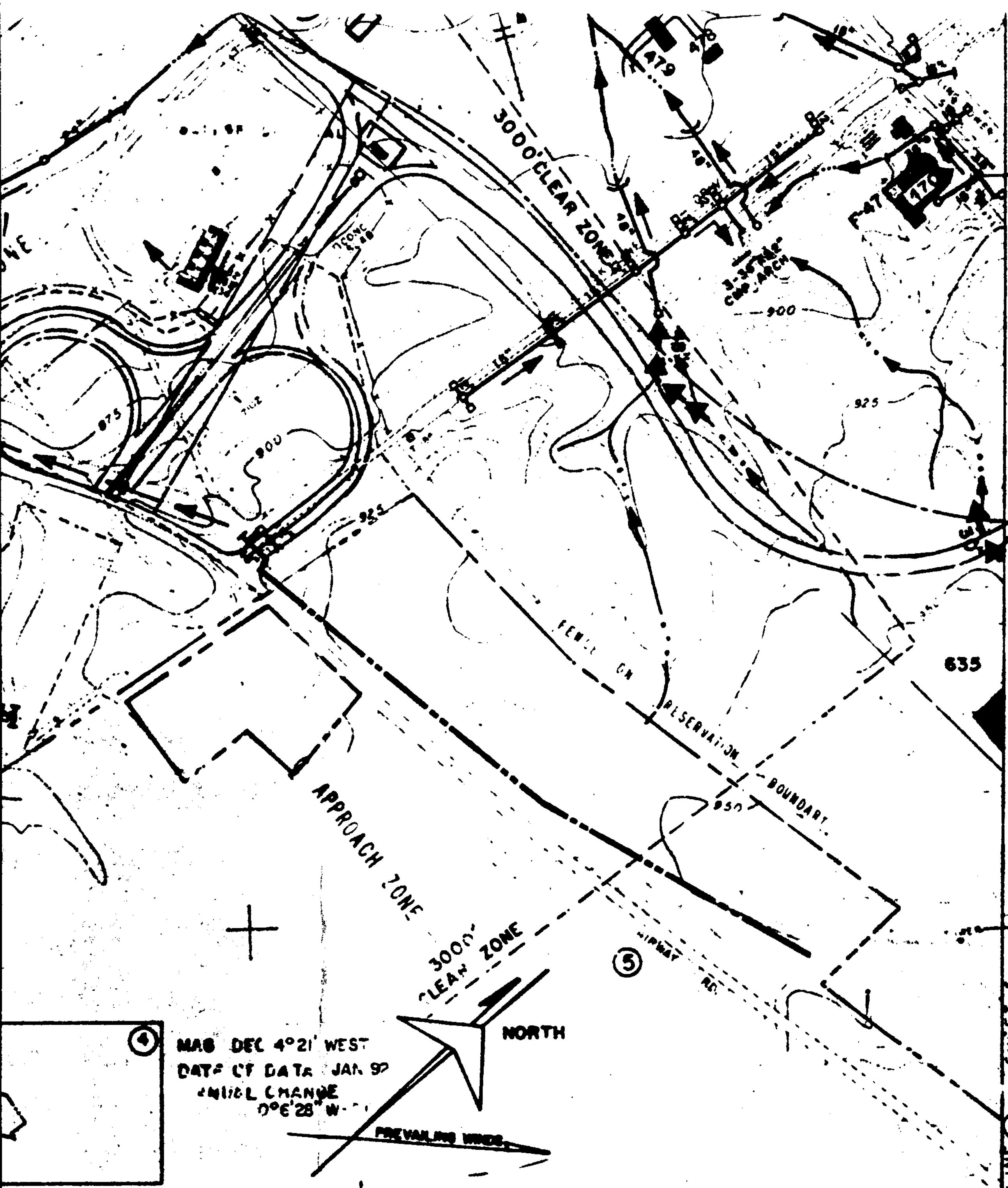
EVISION UPDATE | VRM

FICIAL USE ONLY (AFF 11-30)



BY:

2. PROP
CENT
SHOW

3. ALL
AS P
PLAN

4. NAT
SYS
DISCHARGE
001
002

AIRFIELD EL

REV	DATE	DESCRIPTION	INITIAL
7	9-30-90	ANNUAL REVISION UPDATE	JRH
9	9-30-9[illegible]	ANNUAL R[illegible]	ERO
8	9-30-92	ANNUAL REVISION UPDATE	JRH

PLAN REVISIONS

DEPAR

HEADQUART

MASTE

STORM

WRIGHT -

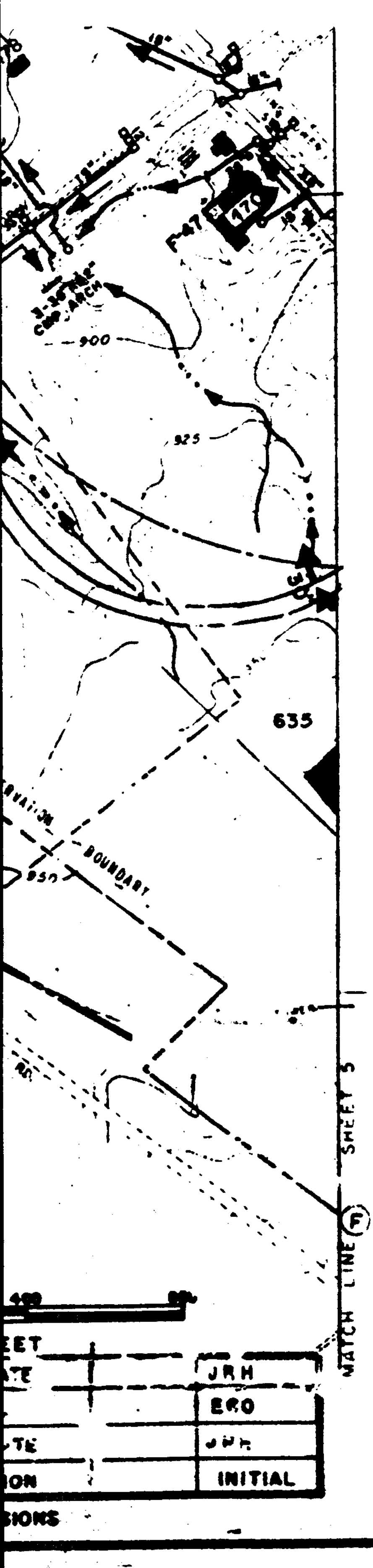
SCALE: 1 INCH = 40

CONTRACT NO.

[illegible]

ST. LOUIS

158616



BY: CIP — CAST IRON PIPE
CMP — CORRUGATED METAL PIPE
VCP — VETRIFIED CLAY PIPE

2. PROPOSED FACILITIES, BUILDINGS, BUILDING NUMBERS AND CENTERLINE OF ROADS ARE IN ACCORDANCE PROPOSALS SHOWN ON TAB F-1 DATED APRIL, 1965.

3. ALL INFORMATION SHOWN IN AREA "B" WAS PREPARED AS PART OF THE HARLAND BARTHOLOMEW MASTER PLAN CONTRACT DATED APRIL, 1965.

4. NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM SAMPLING POINTS (NPDES)

DISCHARGE S/N	SITE	LOCATION
001	39° 47' 2?"	84° 0?' 38"
002	39° 4?' 26"	84° 0?' 38"

AIRFIELD ELEVATION 824 FEET

E

F

DEPARTMENT OF THE AIR FORCE

HEADQUARTERS AIR FORCE LOGISTICS COMMAND

MASTER PLAN — AREA B

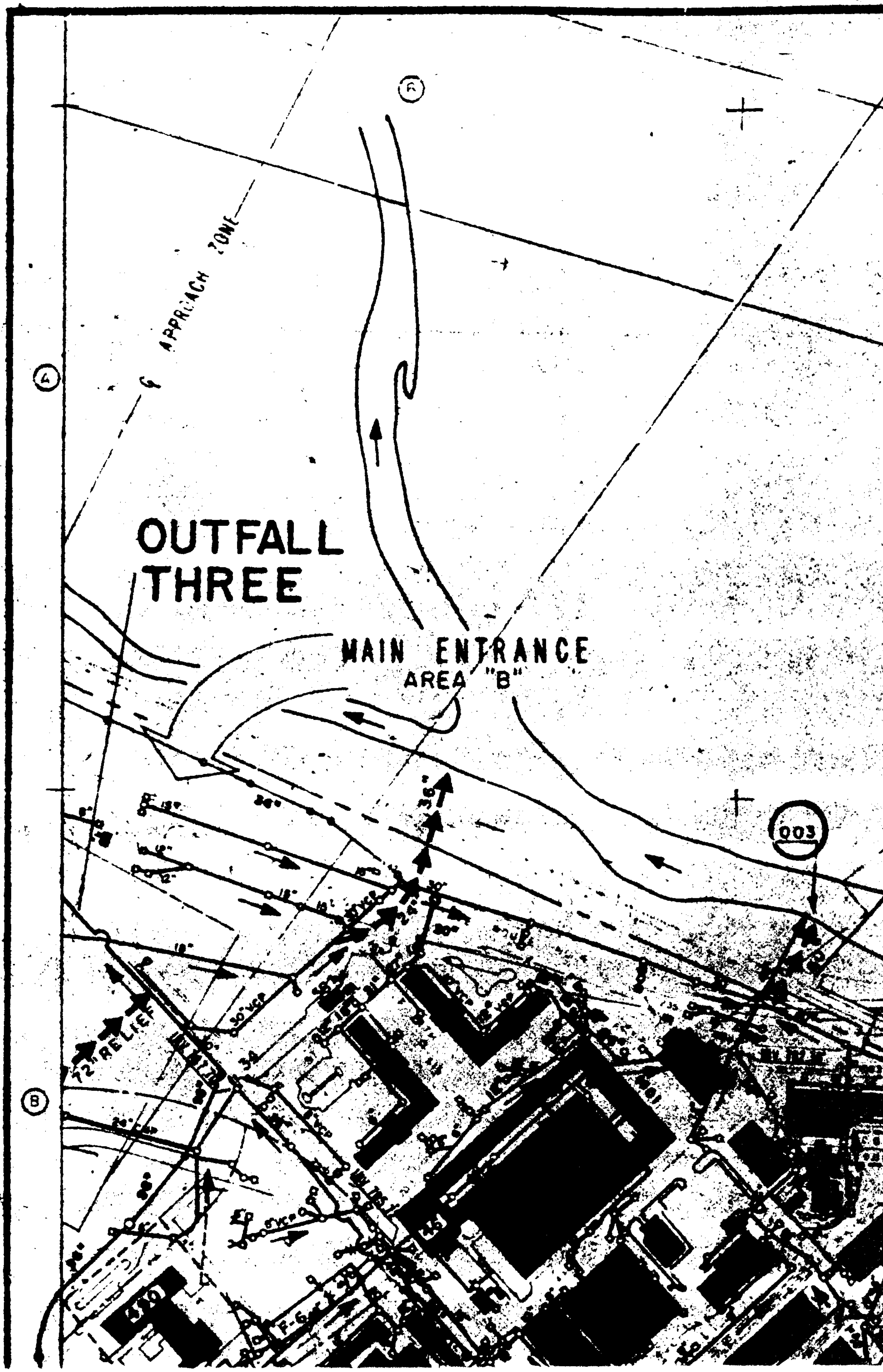
STORM DRAINAGE SYSTEM

WRIGHT-PATTERSON AIR FORCE BASE

FAIRBORN, OHIO

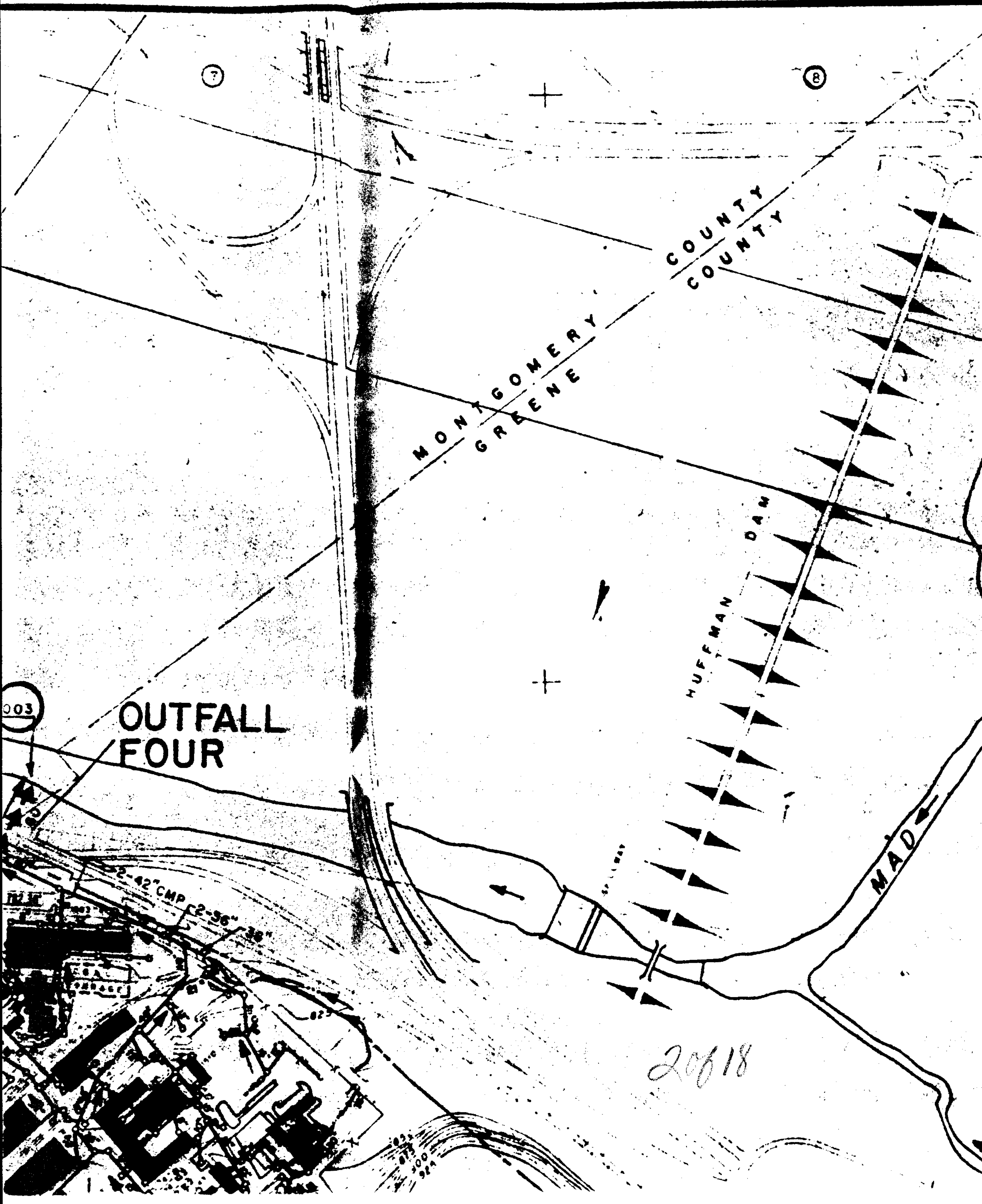
SCALE: 1 INCH = 400 FT	DATE: ?2 APRIL 1965	TAB NO. ?
CONTRACT NO.	A ?? 33(6?1)?3/8	
HARLAND BARTHOLOMEW AND ASSOCIATES ST. LOUIS	MISSOURI	SHEET 1 OF 6

16 of 16



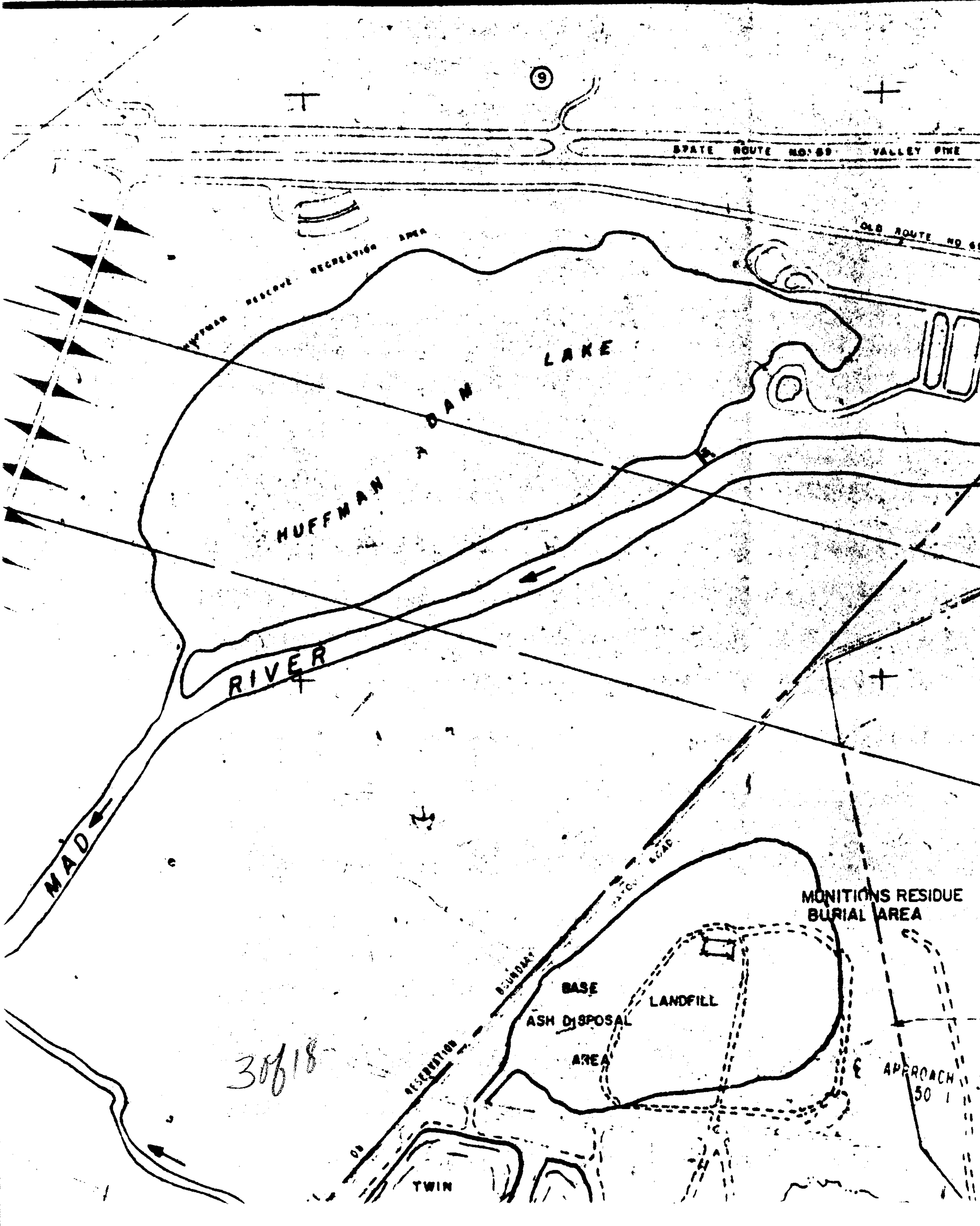
OUTFALL
THREE
MAIN ENTRANCE
AREA "B"
APPROACH ZONE
003
72" RELIEF
36"

10618

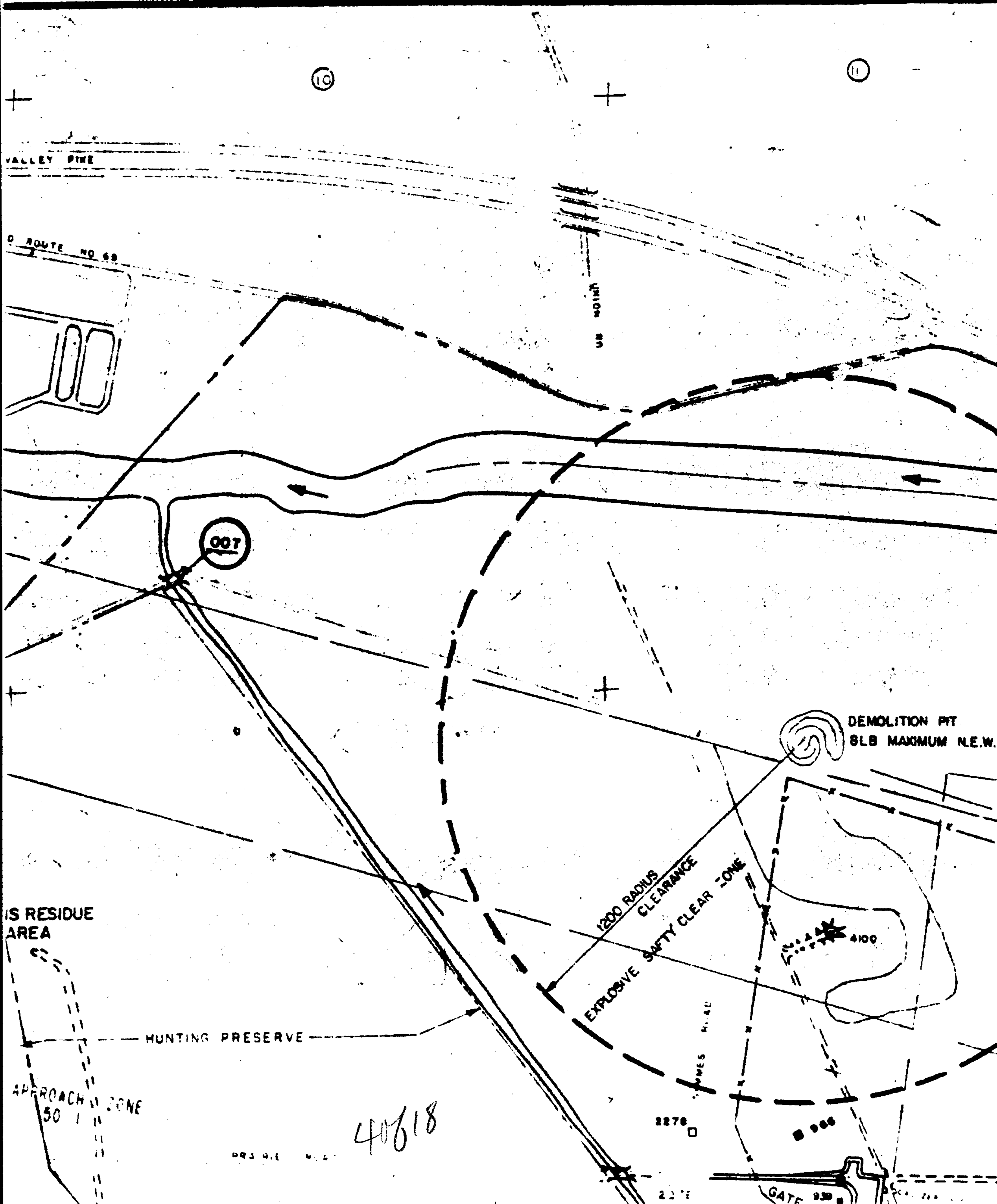


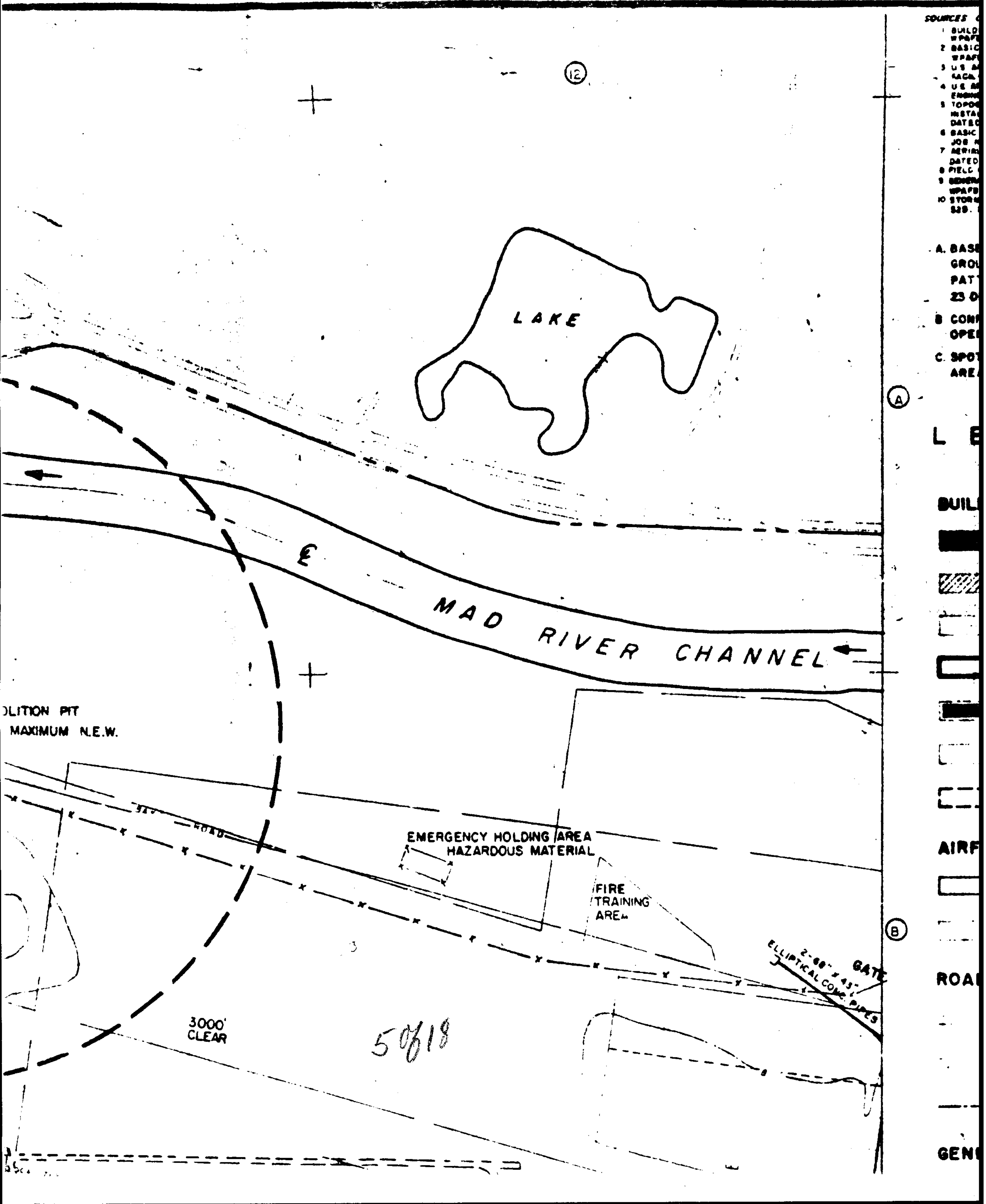
7
8
MONTGOMERY COUNTY
GREENE COUNTY
HUFFMAN DAM
003
OUTFALL
FOUR
2-42" CMP
2-36"
38"
MAD
2of18

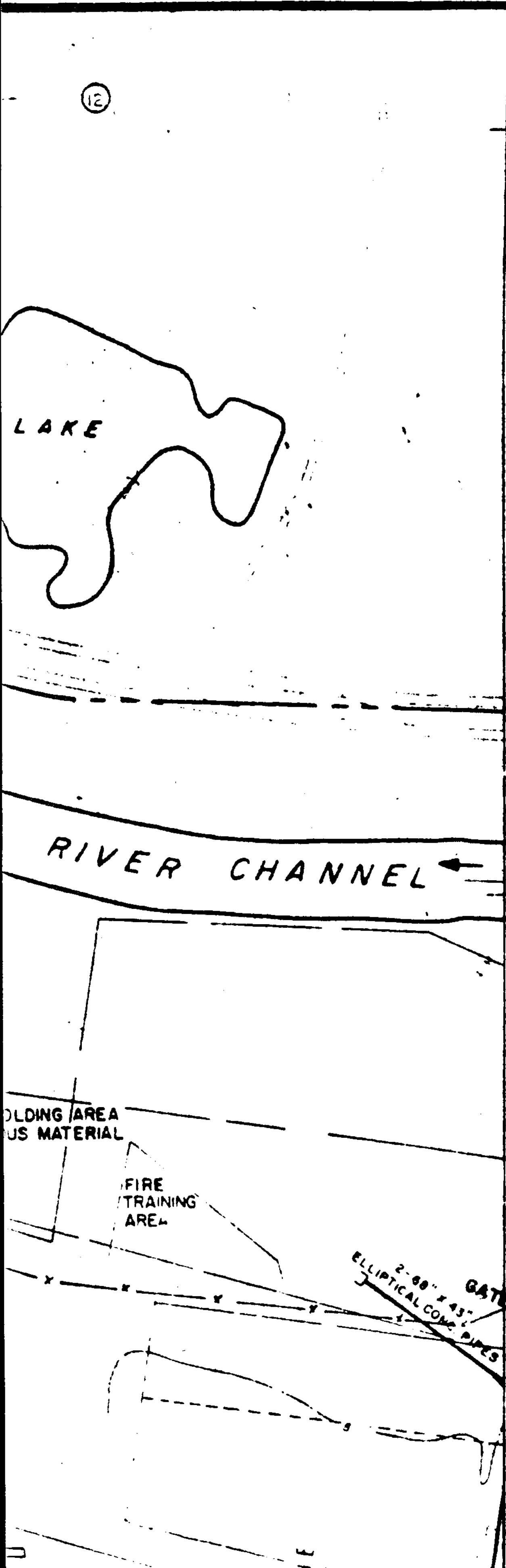
FOR OFFICIAL U



FICIAL USE ONLY (AFR 11-30)




12
LAKE
MAD RIVER CHANNEL
MAXIMUM N.E.W.
EMERGENCY HOLDING AREA
HAZARDOUS MATERIAL
FIRE
TRAINING
3000'
CLEAR
GATE
A
B
5 of 18



SOURCES OF INFORMATION

1 BUILDING LOCATION PLAN, AREAS A, B & C, AIR INSTALLATIONS WPAFB DWG NO TSW-PF-150, SHEET D, DATED FEB. 18, 1957
2 BASIC LAYOUT PLAN, AREAS A, B, C & D, AIR INSTALLATIONS WPAFB DWG NO EWPE-150, SHEET K, DATED APRIL 1, 1956
3 U.S. ARMY ENGINEER DISTRICT, LOUISVILLE, SAC DISPERSAL FACILITIES DWG NO. WPF 112, DATED MAY 1958
4 U.S. ARMY ENGINEER DISTRICT, LOUISVILLE, NUCLEAR ENGINEERING TEST FACILITIES DWG NO WPF-89, DATED APRIL 1958.
5 TOPOGRAPHY & BUILDING LOCATION PLAN, AREAS A & C, AIR INSTALLATIONS WPAFB DWG NO TSW-PF 150, SHEET H, DATED OCT 2, 1957
6 BASIC LAYOUT PLAN, AREAS B & D, AIR INSTALLATIONS WPAFB JOB NO 27-1252, SHEET 1 OF 1, DATED OCT 2, 1957
7 AERIAL PHOTOGRAPHS, AIR INSTALLATIONS, WPAFB DATED AUG 1958
8 FIELD CHECK BY GROLL BEACH & ASSOCIATES, JULY & AUG 1958
9 GENERAL UTILITY MAPS - STORM SEWER SYSTEM - AREA "B"; WPAFB DWG. NO 27-1764 B, SHEET 1 THRU 5, DATED JULY 1958, REV.
10 STORM-MASTER PLOT PLAN - AREAS A B C, WPAFB DWG. NO. [illegible] 520, SHEETS B,C,F,G,H,L,R & O, DATED JULY 1958, REV.

A. BASE MAP AND EXISTING UTILITY LAYOUT ARE FROM GROLL-BEACH AND ASSOCIATES DRAWINGS - WRIGHT PATTERSON AIR FORCE BASE MASTER PLAN DATED 23 DECEMBER, 1959.

B. CONFERENCES WITH DESIGN, MAINTENANCE AND OPERATING PERSONNEL - MARCH - MAY, 1964.

C. SPOT CHECK OF 1" = 20' UTILITY GRID MAPS OF AREA B - MARCH - MAY, 1964.

L E G E N D

BUILDINGS & STRUCTURES

PERMANENT

SEMI-PERMANENT

TEMPORARY

PROPOSED

UNDERGROUND

OTHER THAN MILITARY

TO BE REMOVED

AIRFIELD PAVEMENT

EXISTING

ABANDONED

ROADS & PARKING

SURFACED

UNIMPROVED

℄ PROPOSED ROADS

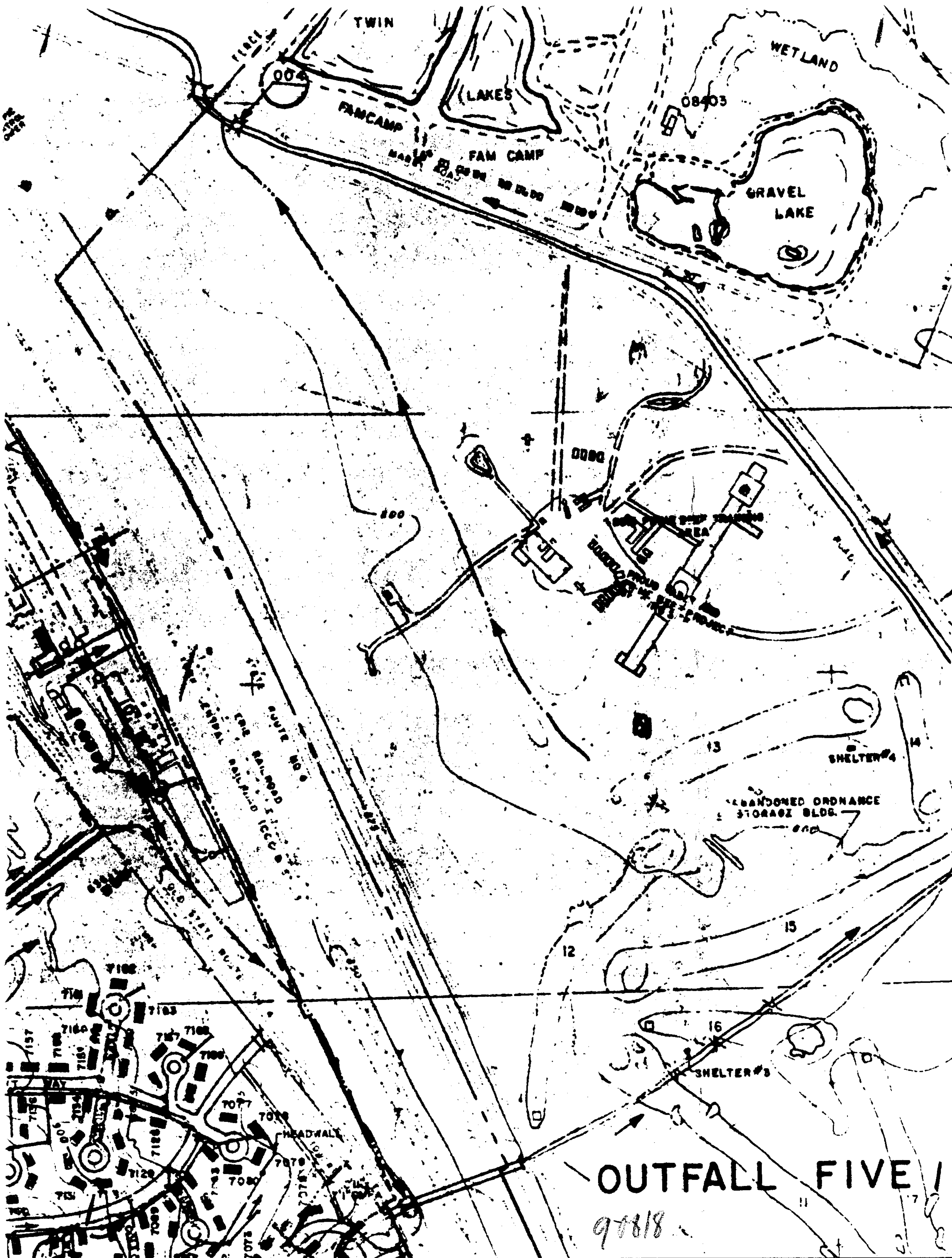
GENERAL

60618

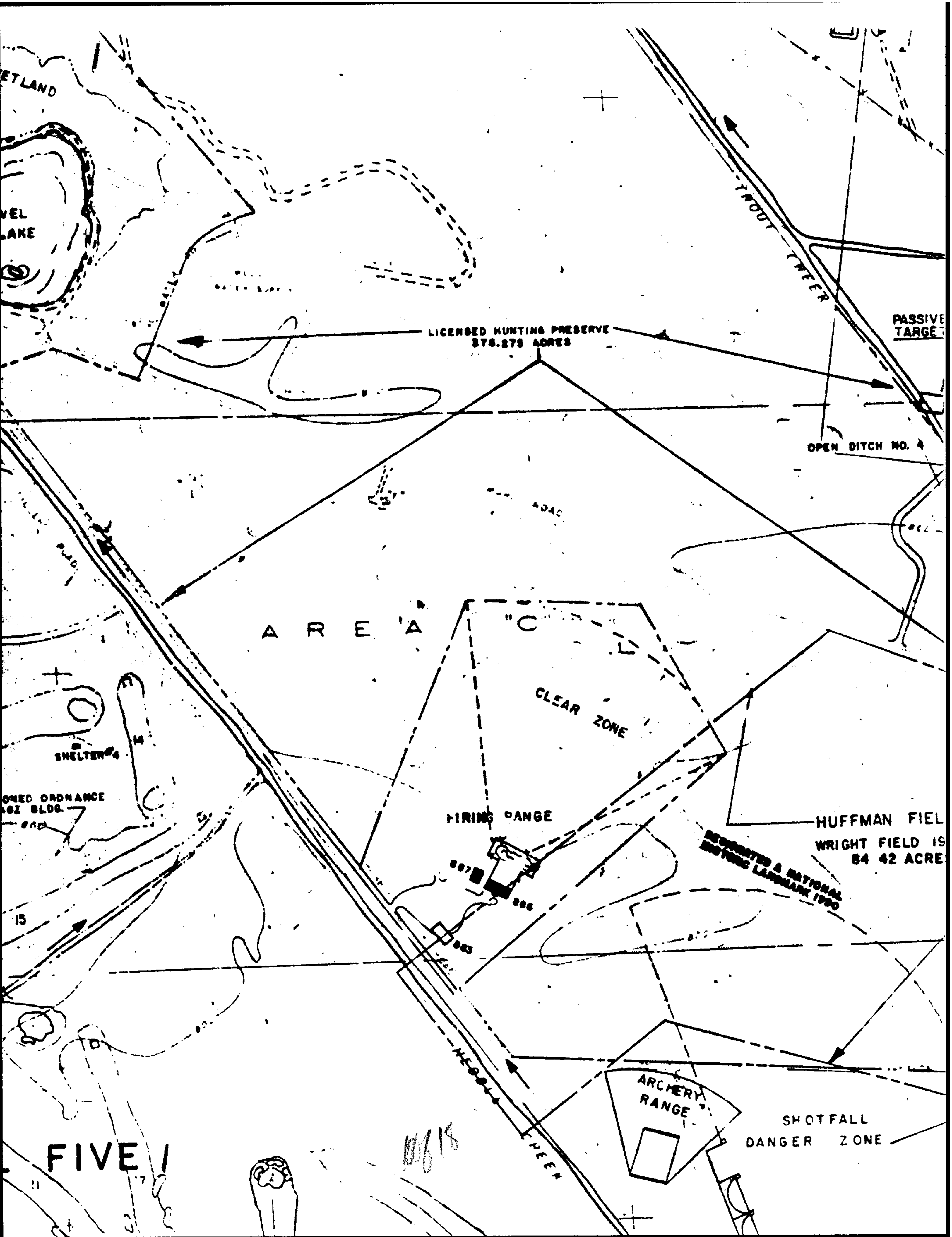
7818


MATCH LINE SHEET 1
C
D
790
1628
DRIVE
73G
1627
SKYLINE
LOW AREA
651
652
653
654
RADIOACTIVE
24

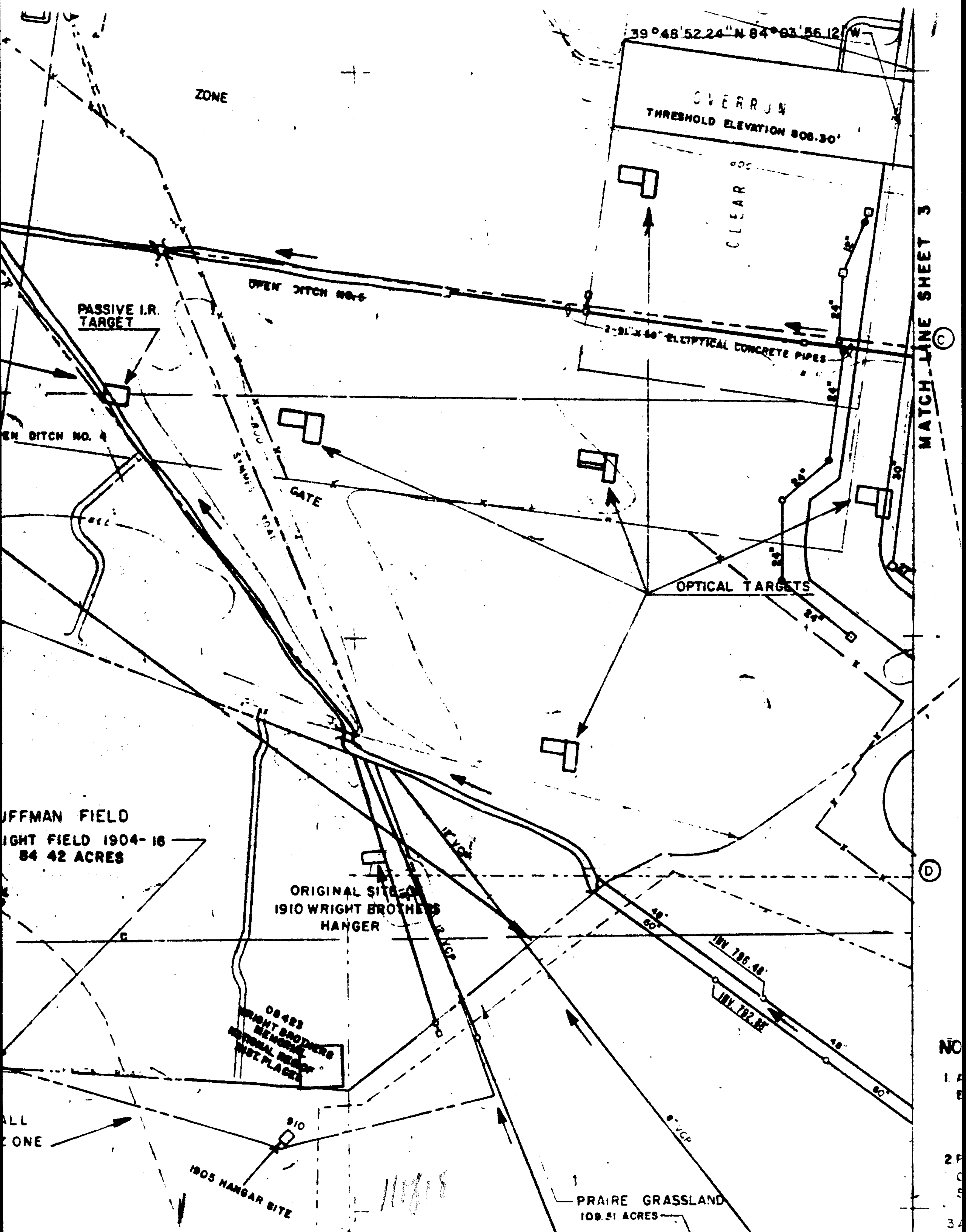
WRIGHT MEMORIAL
SKYLINE DRIVE
24"
GATE 430
DUPONT WAY
7153
7152
7151
7150
7149



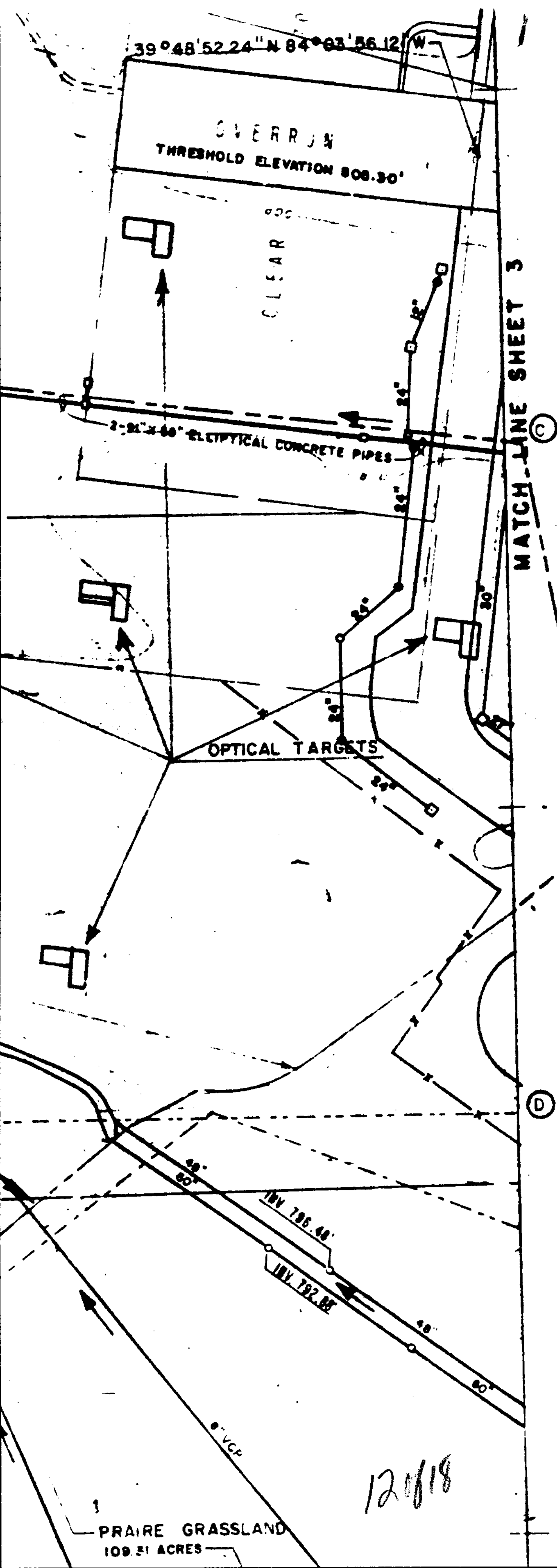
TWIN
LAKES
FAMCAMP
FAM CAMP
WETLAND
08403
GRAVEL
LAKE
SHELTER #4
ABANDONED ORDNANCE
STORAGE BLDG.
SHELTER #3
HEADWALL
13
14
15
12
16
OUTFALL FIVE
97818



ETLAND
VEL
LAKE
LICENSED HUNTING PRESERVE
376.275 ACRES
TROUT CREEK
PASSIVE
OPEN DITCH NO. 4
AREA "C"
CLEAR ZONE
FIRING RANGE
887
886
883
SHELTER #4
14
15
HUFFMAN FIEL
WRIGHT FIELD 19
84 42 ACRE
DESIGNATED A NATIONAL HISTORIC LANDMARK 1990
ARCHERY RANGE
SHOTFALL DANGER ZONE
HEBBLE CREEK
FIVE



39°48'52.24" N 84°03'56.12" W
OVERRUN
THRESHOLD ELEVATION 806.30'
CLEAR
ZONE
OPEN DITCH NO. 6
2-91" x 60" ELLIPTICAL CONCRETE PIPES
MATCH LINE SHEET 3
PASSIVE I.R. TARGET
EN DITCH NO. 4
GATE
OPTICAL TARGETS
UFFMAN FIELD
IGHT FIELD 1904-16
84 42 ACRES
ORIGINAL SITE OF 1910 WRIGHT BROTHERS HANGER
INV 786.48'
INV 792.88'
1905 HANGAR SITE
910
PRAIRE GRASSLAND
109.31 ACRES



PROPOSED BOUNDARY

FENCE

RAILROAD

DRAINAGE DITCH

STREAM OR RIVER

BERM OR LEVEE

RETAINING WALL

EASEMENT

STORM DRAINAGE SYSTEM

PIPE WITH SIZE

MANHOLE

MANHOLE WITH KEY INVERT

CATCH BASIN OR INLET

CULVERT

CONCRETE DRAIN OR PAVED DITCH

FRENCH DRAIN

HEADWALLS

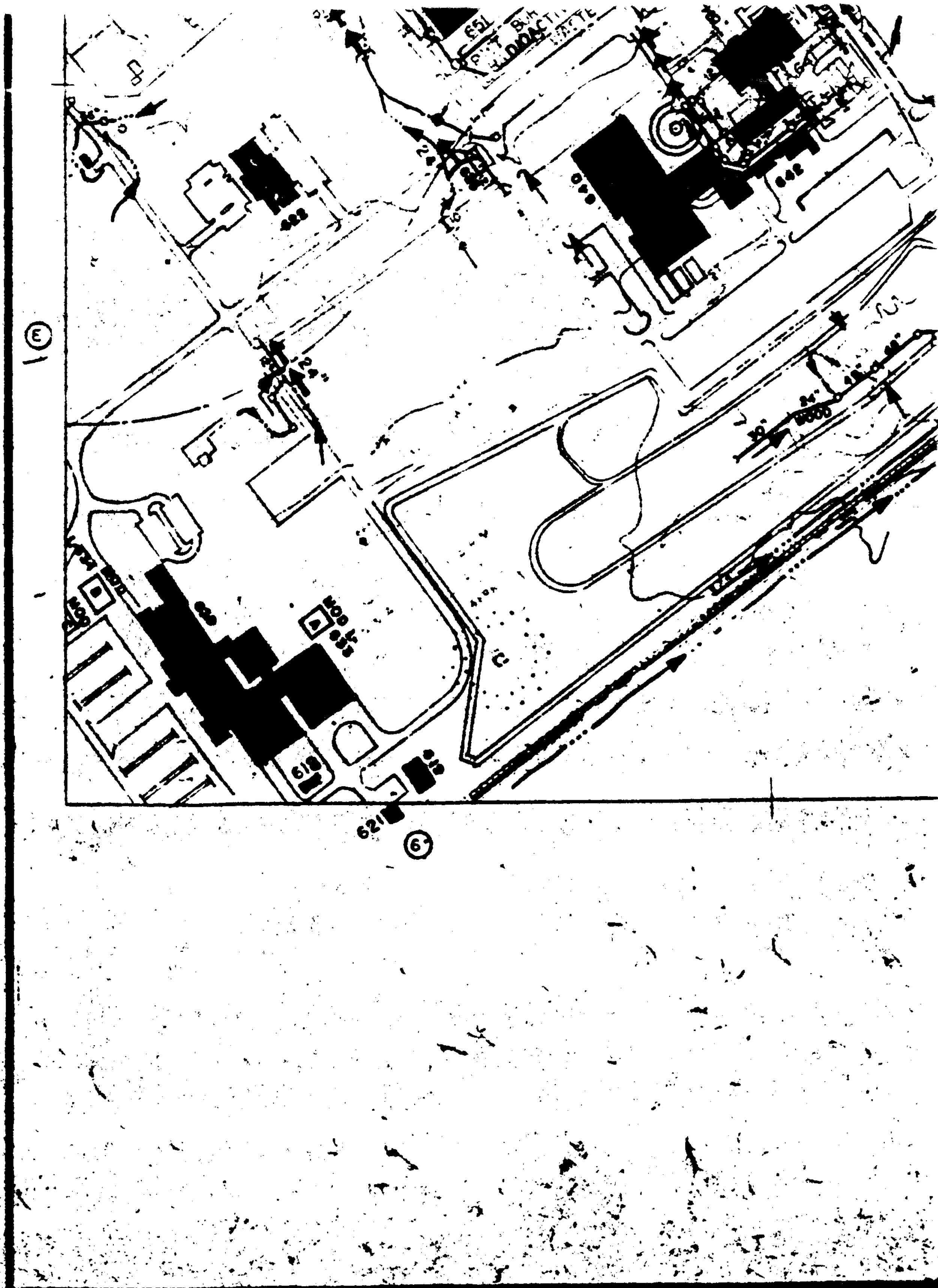
DIRECTION OF FLOW

EXISTING FACILITY TO BE ABANDONED

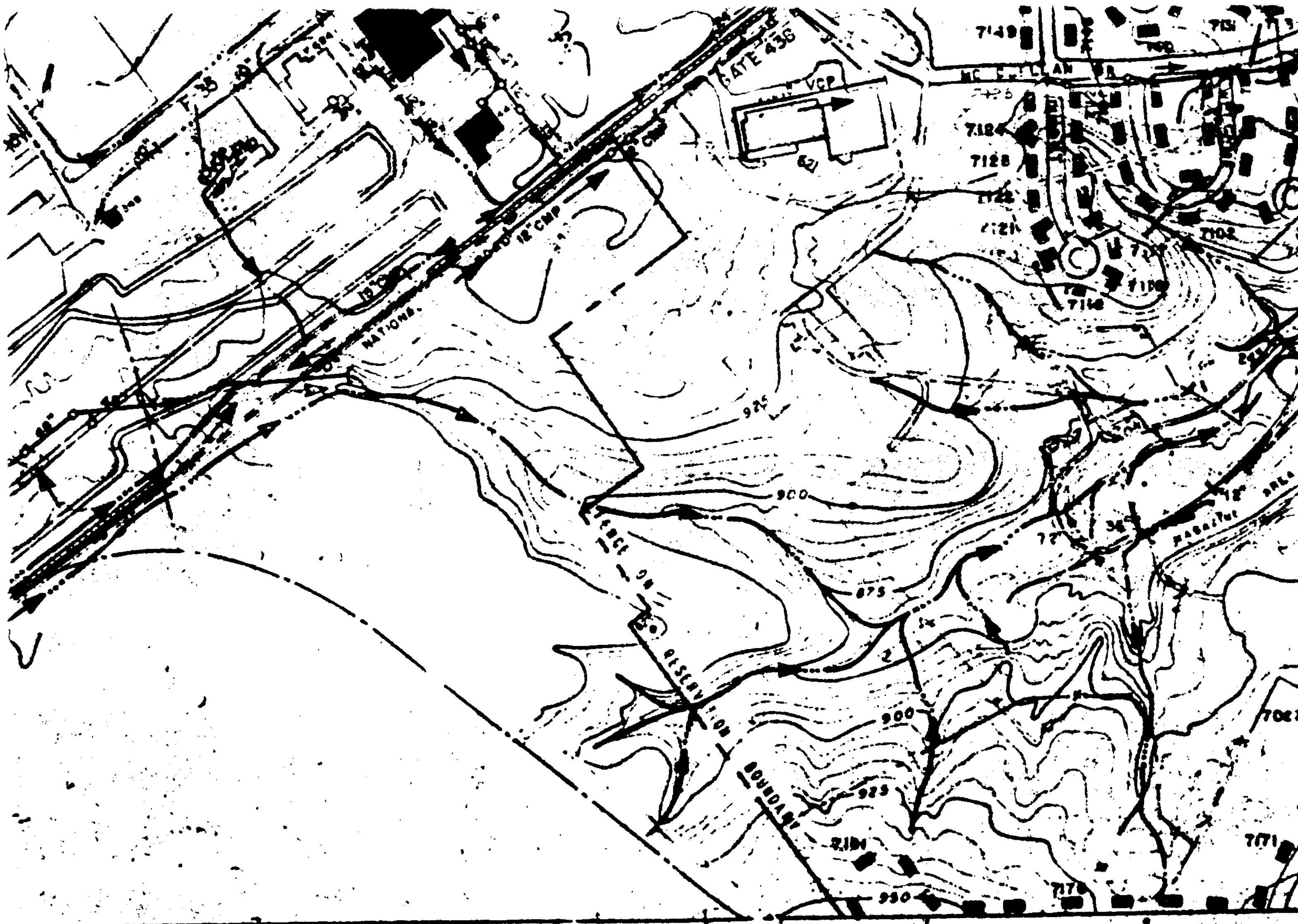
PROPOSED STORM SEWER OR CULVERT (WITH SIZE)

NOTES:

1. ALL PIPE IS CONCRETE UNLESS OTHERWISE NOTED BY CIP – CAST IRON PIPE
   CMP – CORRUGATED METAL PIPE
   VCP – VITRIFIED CLAY PIPE
2. PROPOSED FACILITIES, BUILDINGS, BUILDING NUMBERS AND CENTERLINE OF ROADS ARE IN ACCORDANCE PROPOSALS SHOWN ON TAB F-1 DATED APRIL, 1966.
3. ALL INFORMATION SHOWN IN AREA "B" WAS PREPARED



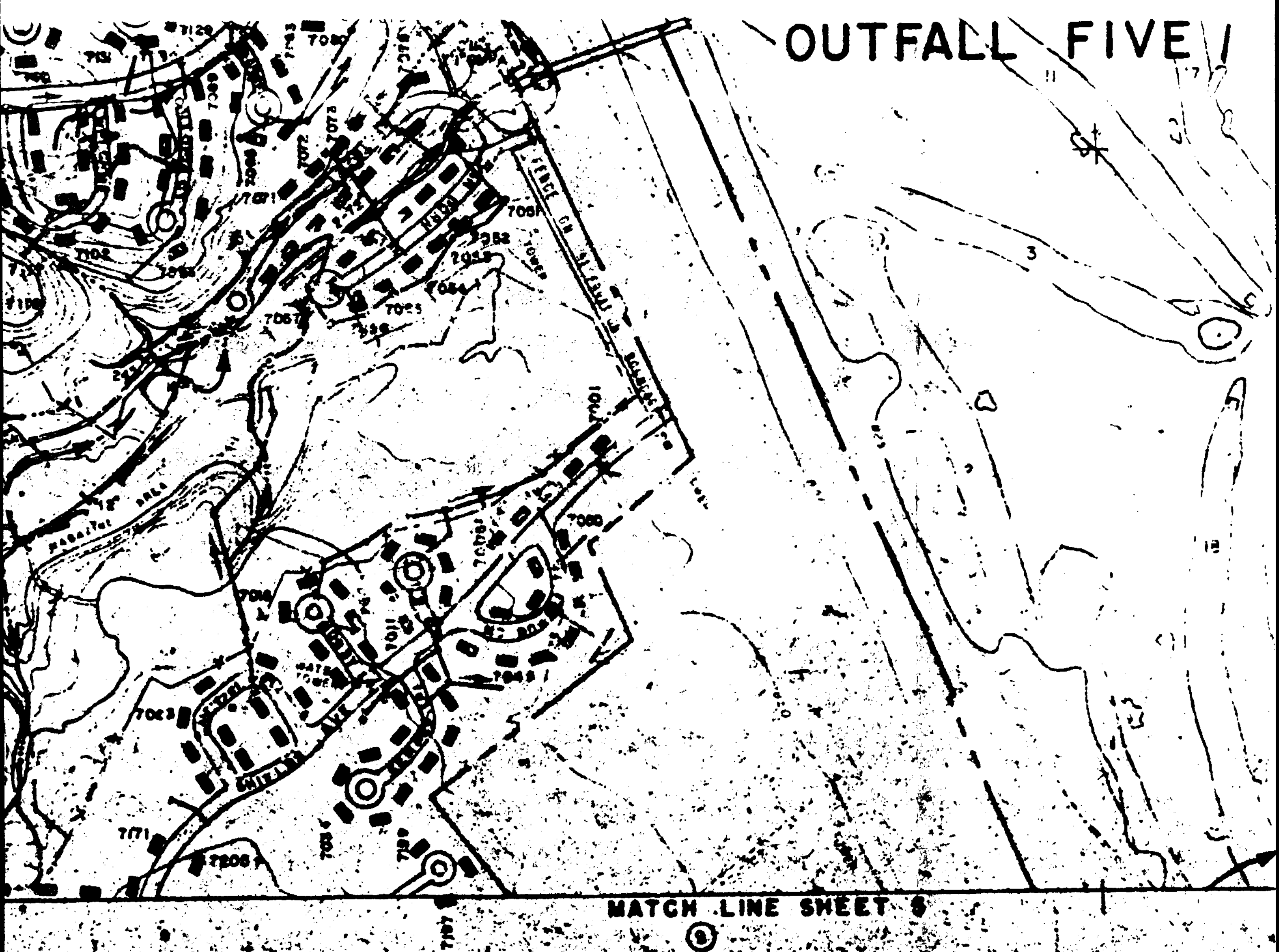
13718


GATE 436
NATIONS
12" CMP
925
900
875
900
925
950
7128
7124
RESERVATION BOUNDARY

7

8

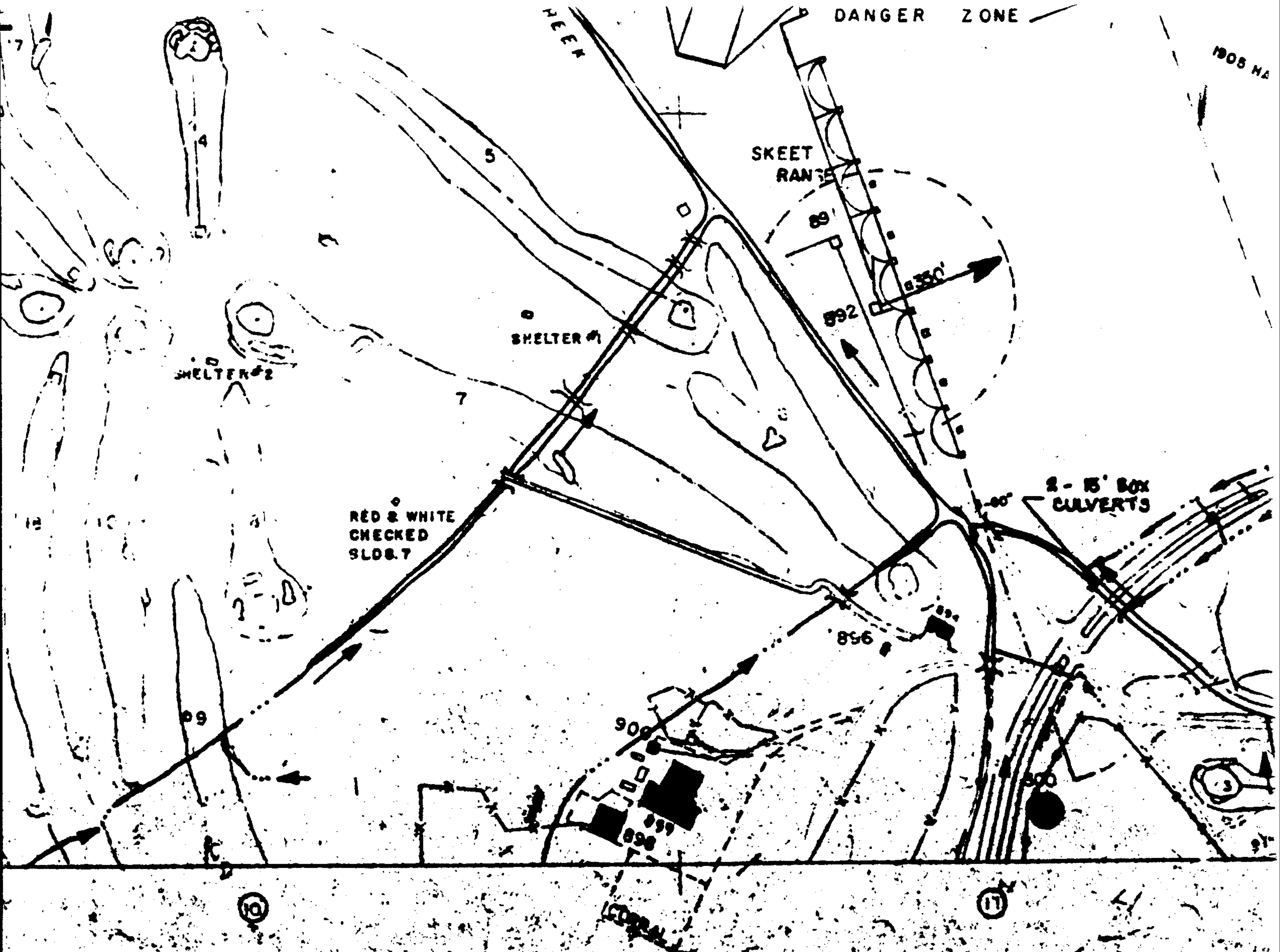
140818



10	[illegible]	ANNUAL REVISION UPDATE
9	[illegible]	ANNUAL REVISION UPDATE
8	[illegible]	ANNUAL REVISION UPDATE

FOR OFFICIAL USE

15 of 18

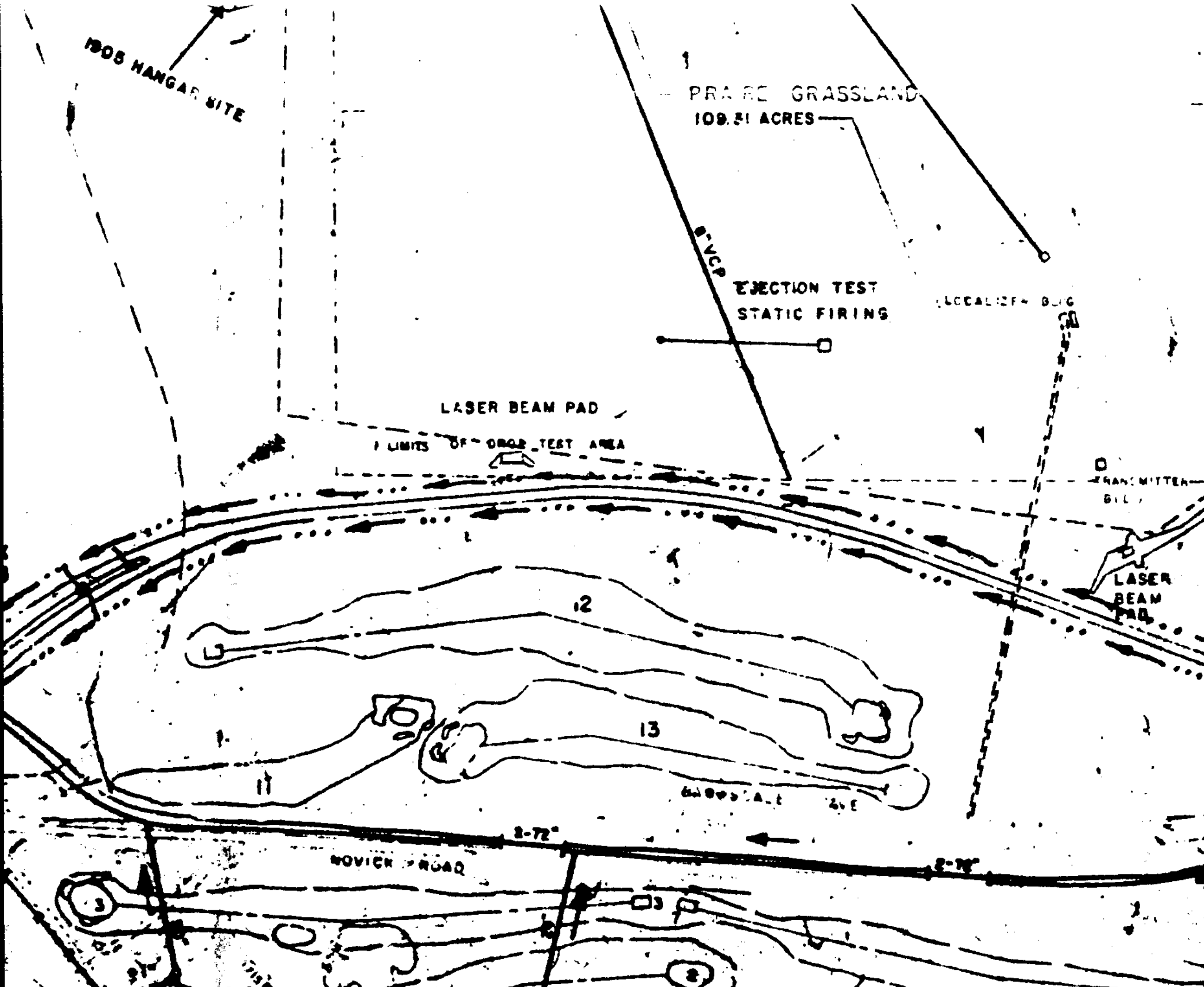


KEY MAP

	VRN
	JRH
	LRB

USE ONLY

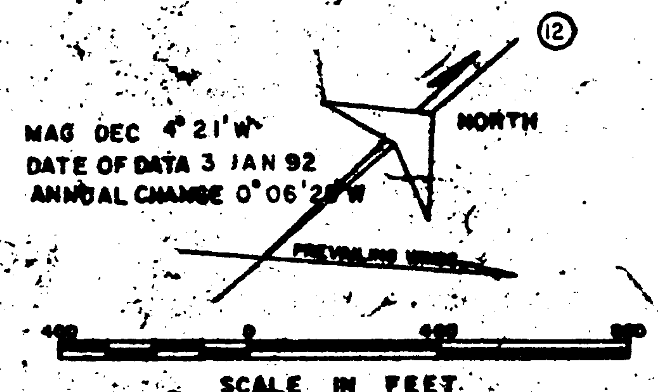
160818



2. PROPOSED FACILITIES
CENTERLINE OF ROA
SHOWN ON TAB F-
3. ALL INFORMATION S
AS PART OF THE H
PLAN REVISION C
4. MAGNETIC DECLI

5. NATIONAL POLLU
SYSTEM SAMPL

DISCHARGE S/N		
003	39°	47'
004	39°	47'
(E)	39°	48'



REV	DATE	DESCRIPTION	INITIAL
7	9-30-90	ANNUAL REVISION UPDATE	JRH
6	9-30-88	ANNUAL REVISION UPDATE	JRH
5	[illegible]	ANNUAL REVISION UPDATE	[illegible]

PLAN REVISIONS

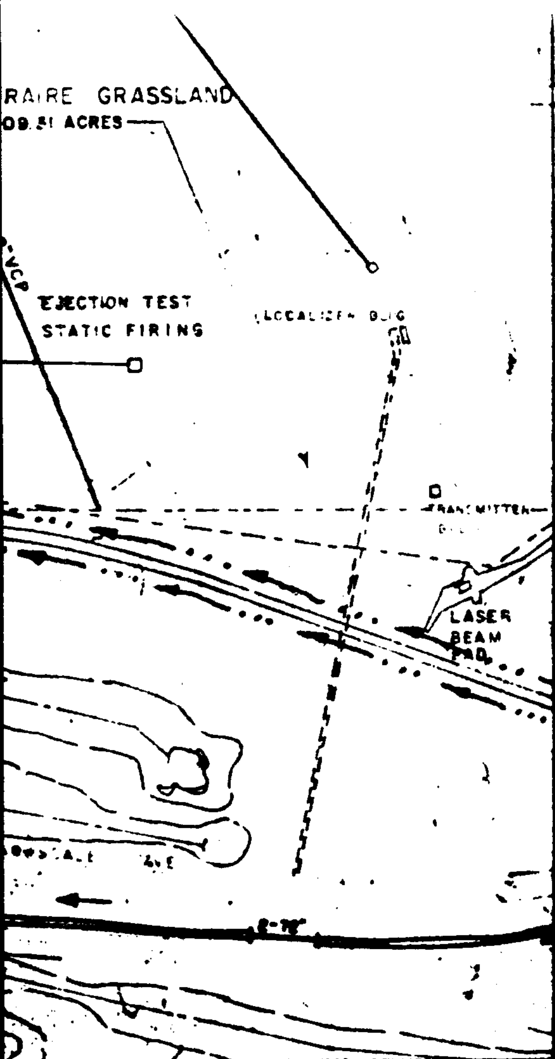
AIRFIELD ELEVATION 82

DEPARTMENT
DIRECTORATE OF CIVIL ENGINEERI
HEADQUARTERS AIR FOR

MASTE
STORM DRAINA
WRIGHT-PATTER
FAIRBOR

SCALE: 1 INCH = 400 FT | DATE:
CONTRACT NO. F 33601-67-
LEO A. DALY CO. ARCHITECTS EN
OMAHA - ST. LOUIS - SEATTLE - SAN FRANCISC

17818



2. PROPOSED FACILITIES, BUILDINGS, BUILDING NUMBERS AND CENTERLINE OF ROADS ARE IN ACCORDANCE PROPOSALS SHOWN ON TAB F-1 DATED APRIL, 1966.

3. ALL INFORMATION SHOWN IN AREA "B" WAS PREPARED AS PART OF THE HARLAND BARTHOLOMEW MASTER PLAN REVISION CONTRACT DATED APRIL, 1965.

4. MAGNETIC DECLINATION & ANNUAL CHANGE

5. NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM SAMPLING POINTS (NPDES)

DISCHARGE S/N	SITE LOCATION		LOCAL
003	39° 47' 3[illegible]"	84° 06' 14"	
004	39° 47' 54"	84° 05' 38"	
	39° 48' 29"	84° 05' 35"	# 007

(E)

(12)

NORTH

	JRH
	JRH
	JA
	INITIAL

AIRFIELD ELEVATION 824 FEET

DEPARTMENT OF THE AIR FORCE

DIRECTORATE OF CIVIL ENGINEERING DCS/P&E - WASHINGTON, D.C.

HEADQUARTERS AIR FORCE LOGISTICS COMMAND

MASTER PLAN

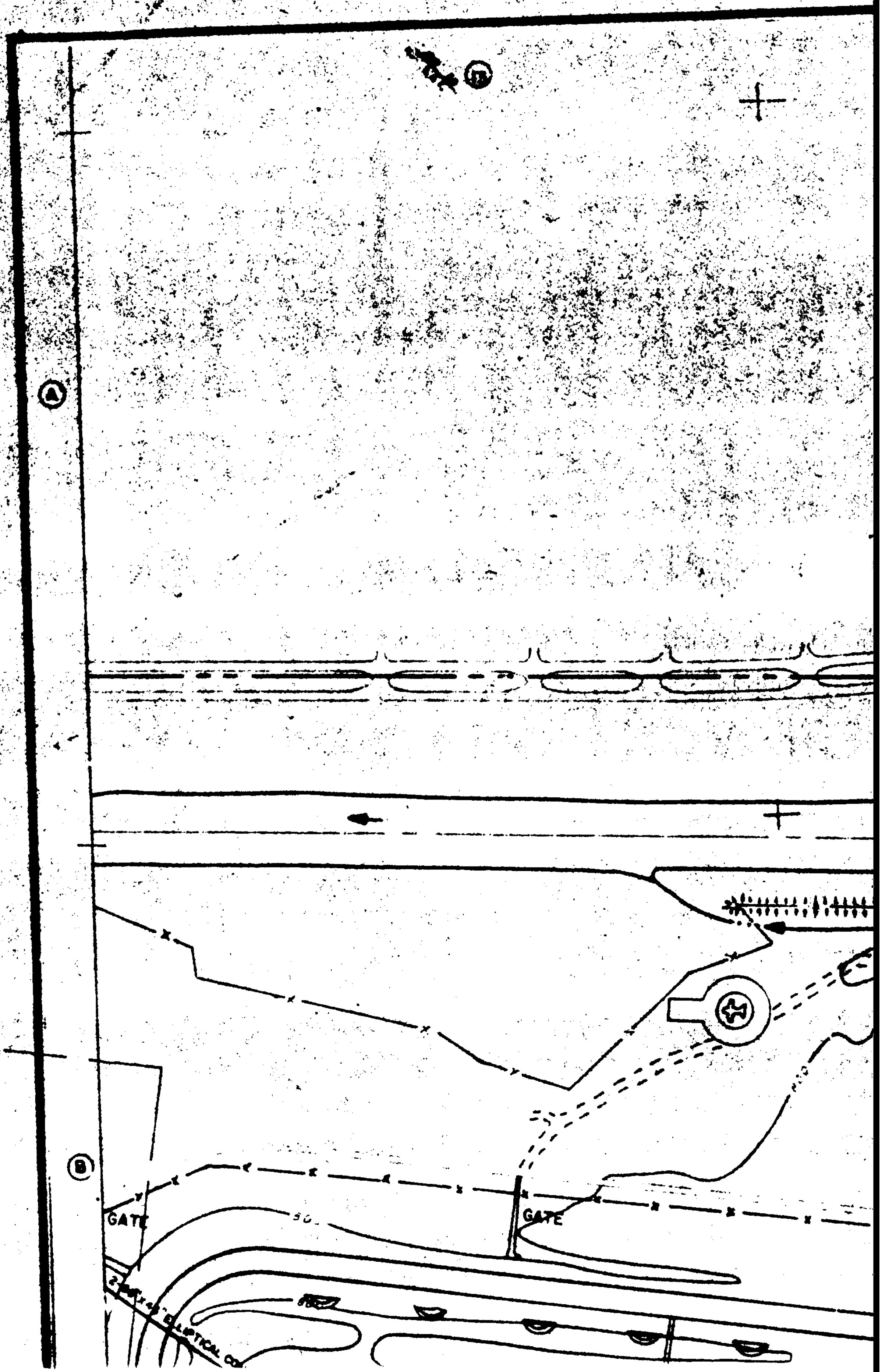
STORM DRAINAGE SYSTEM

WRIGHT-PATTERSON AIR FORCE BASE

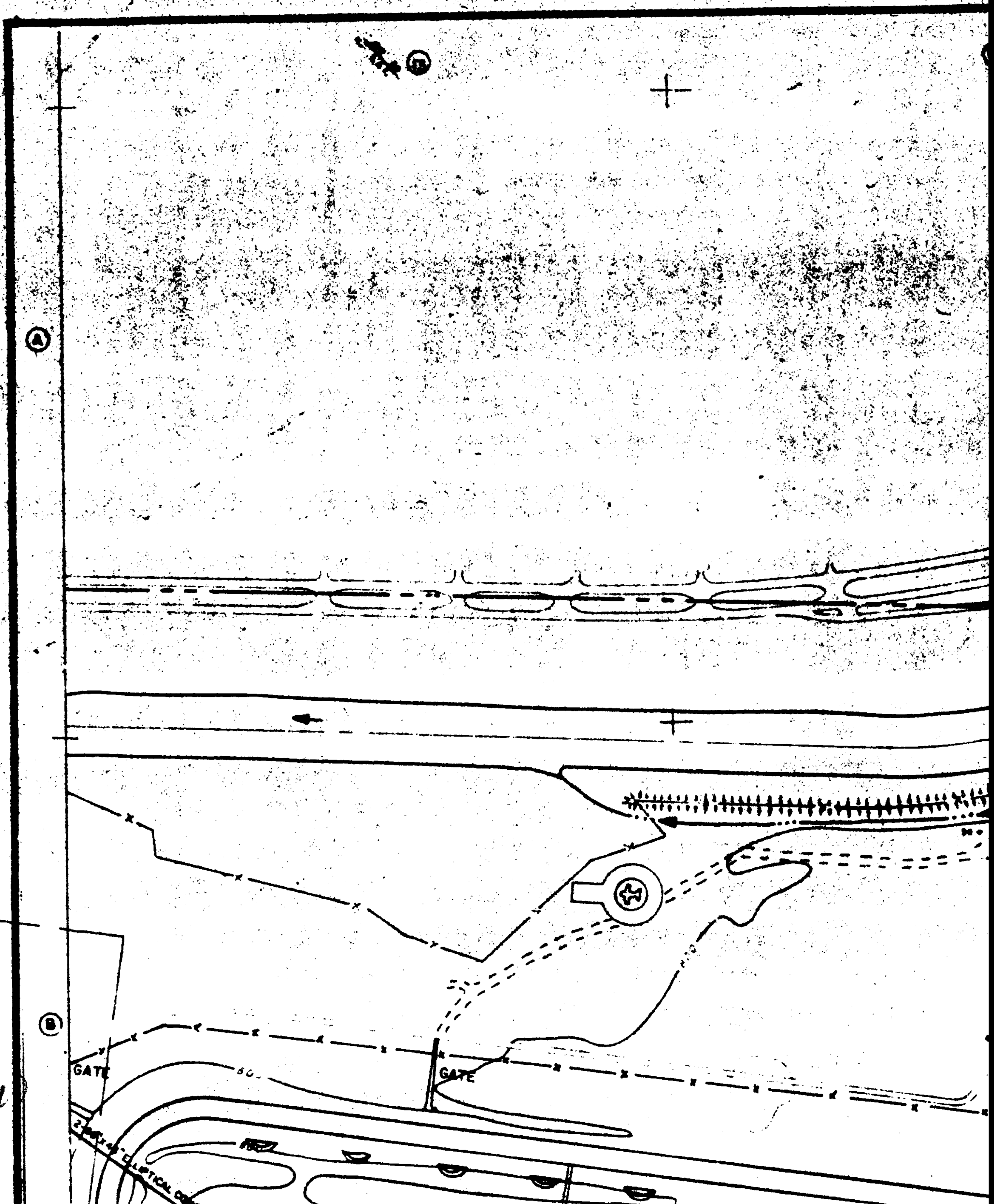
FAIRBORN, OHIO

SCALE: 1 INCH = 400 FT.	DATE:	TAB NO. B-3
CONTRACT NO. AF 33601-67-C-0170		
LEO A. DALY CO. ARCHITECTS ENGINEERS PLANNERS OMAHA - ST. LOUIS - SEATTLE - SAN FRANCISCO - NEW ORLEANS		SHEET 2 OF 6

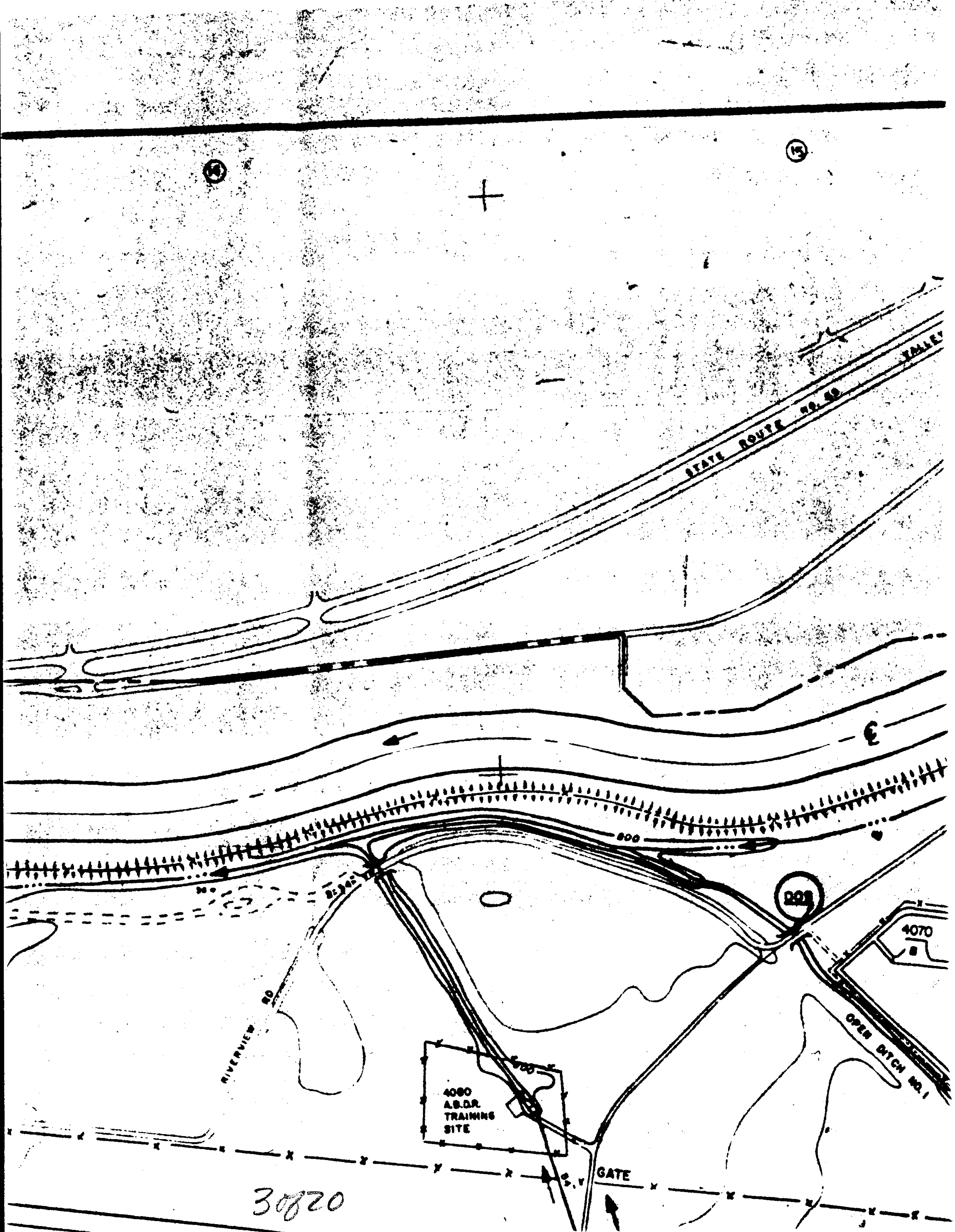
18818



10620

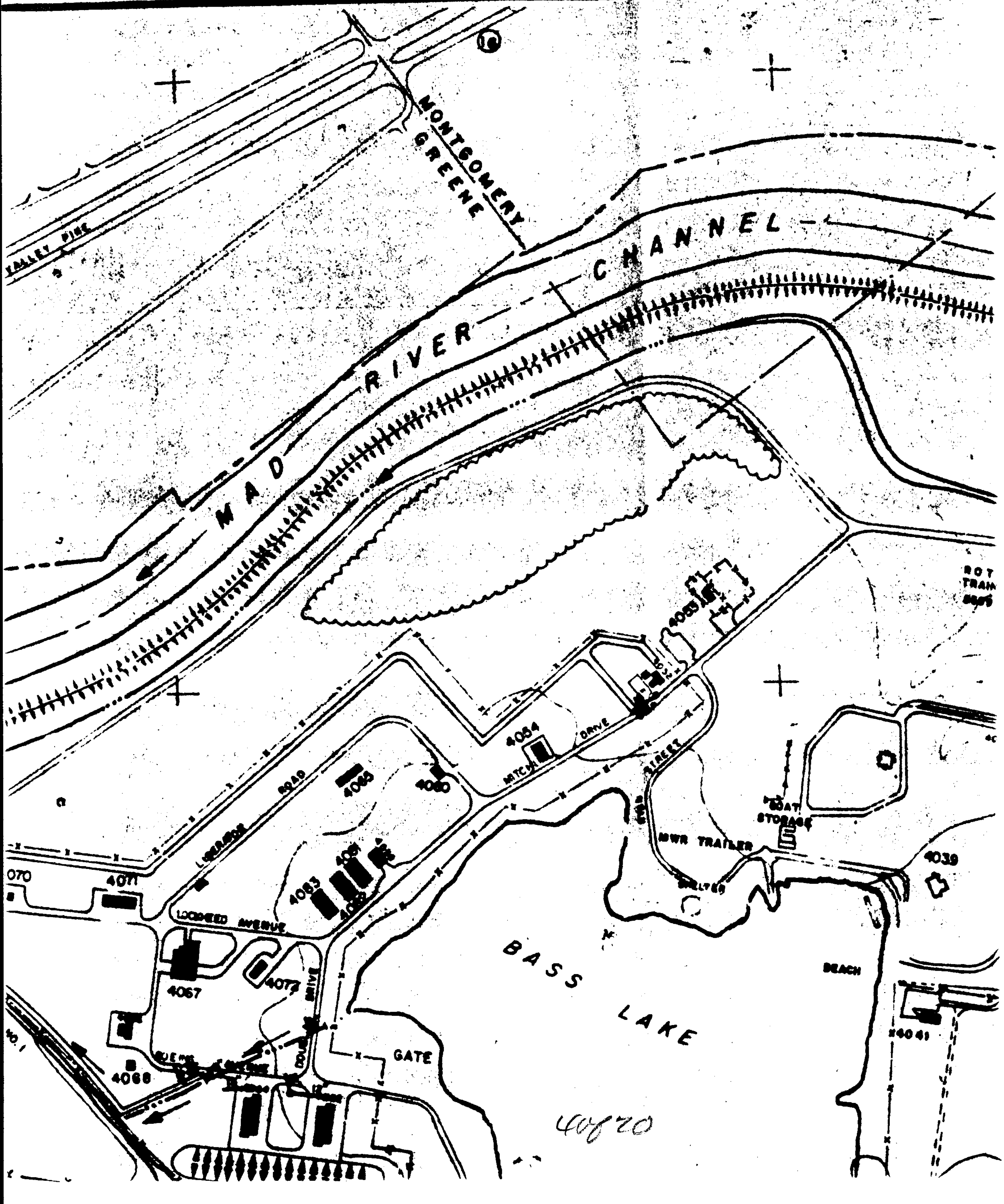


2 of 2

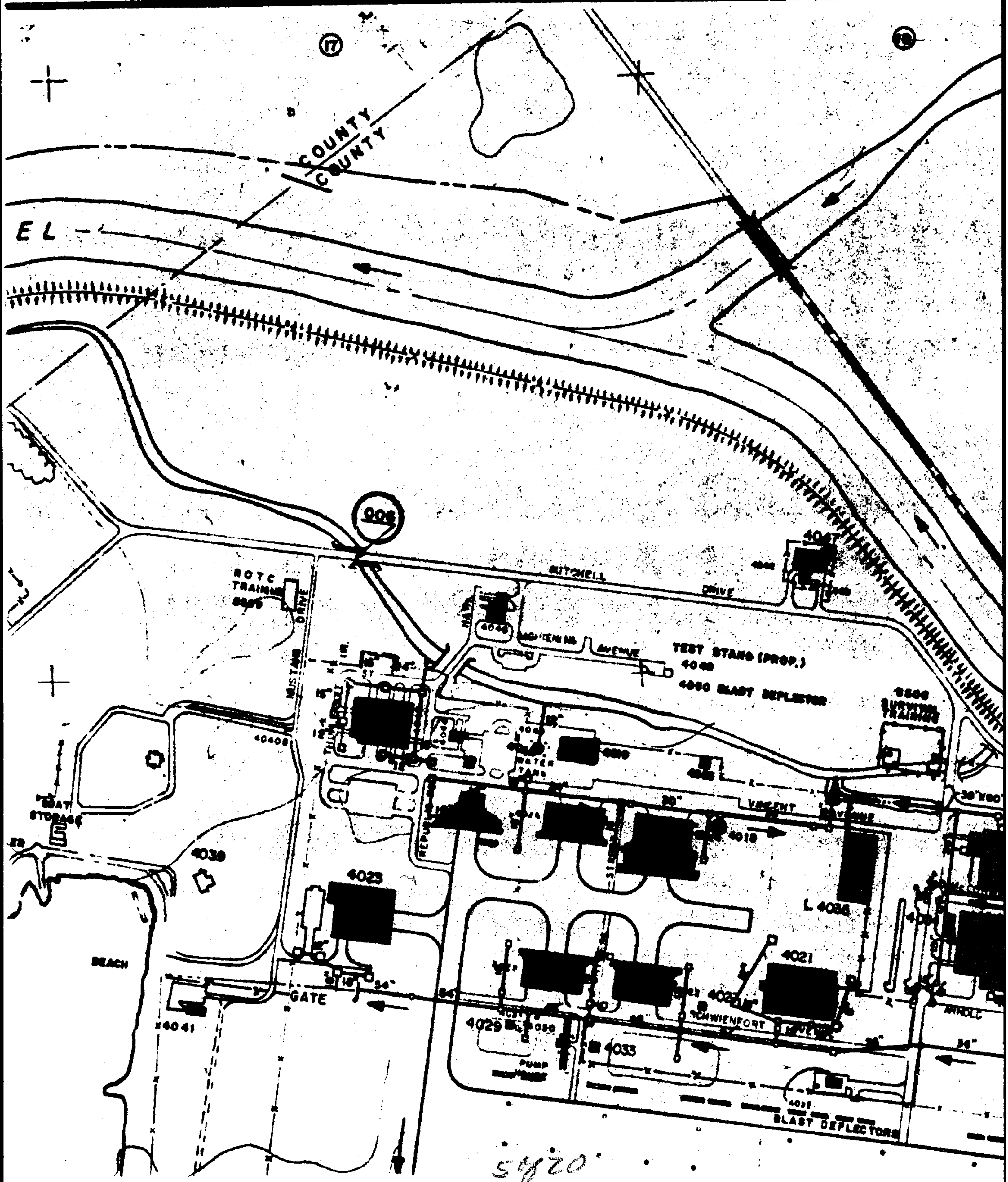

STATE ROUTE NO. 58
4070
OPEN DITCH NO. 1
RIVERVIEW RD
4080
A.B.D.R.
TRAINING
SITE
GATE

30820

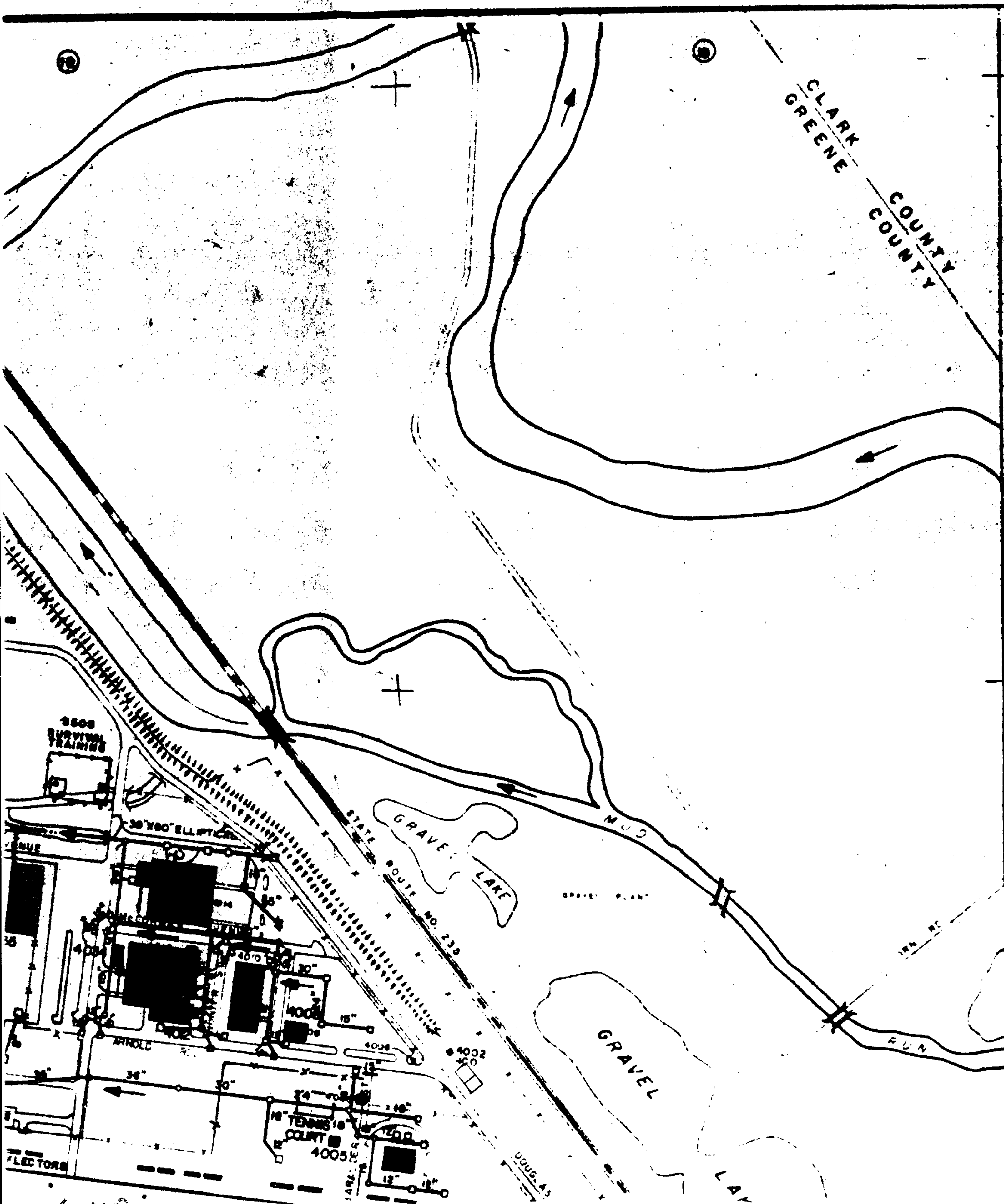
FOR OFFICIAL USE ONl



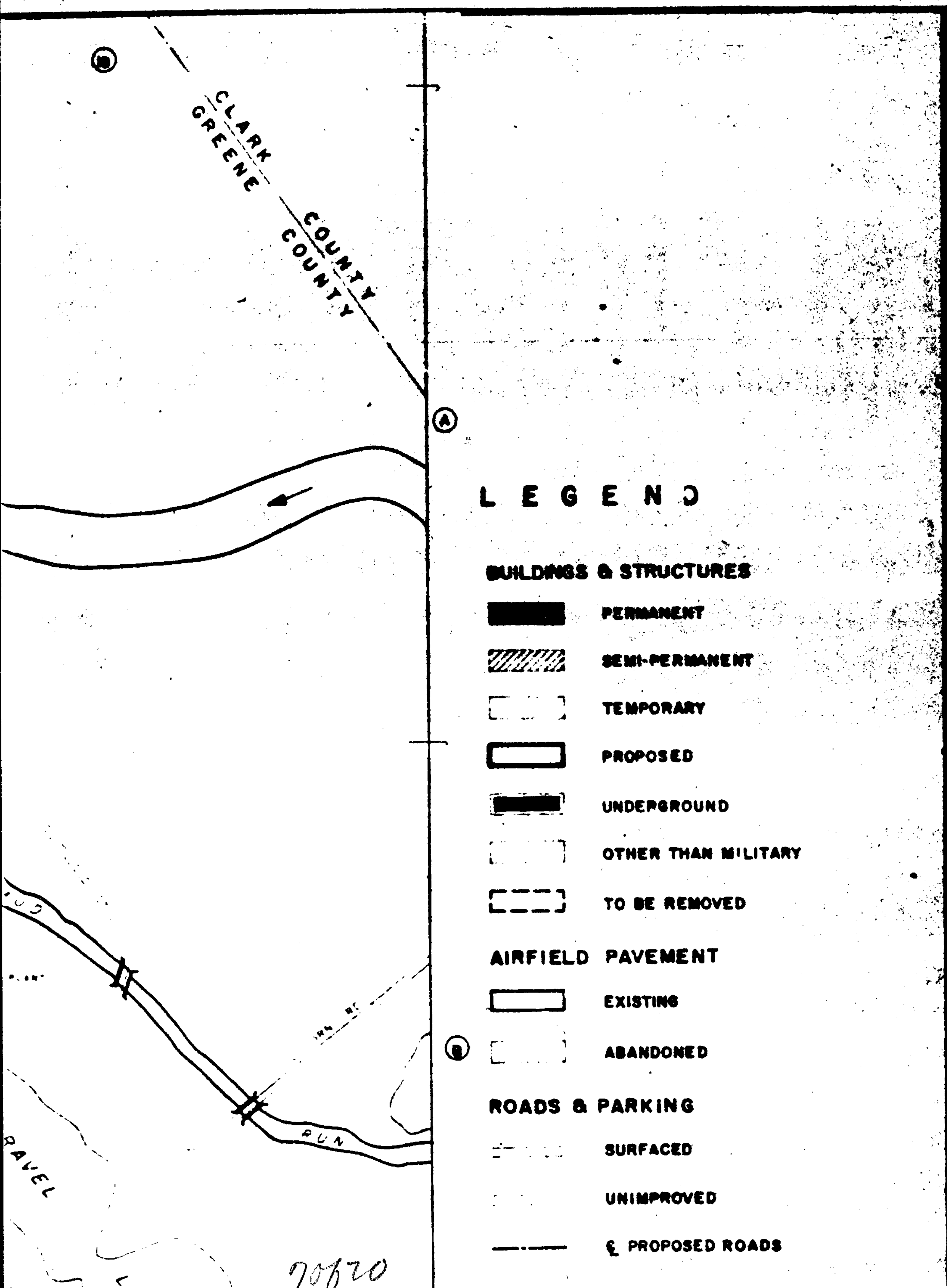
)FFICIAL USE ONLY (AFR 11-30)

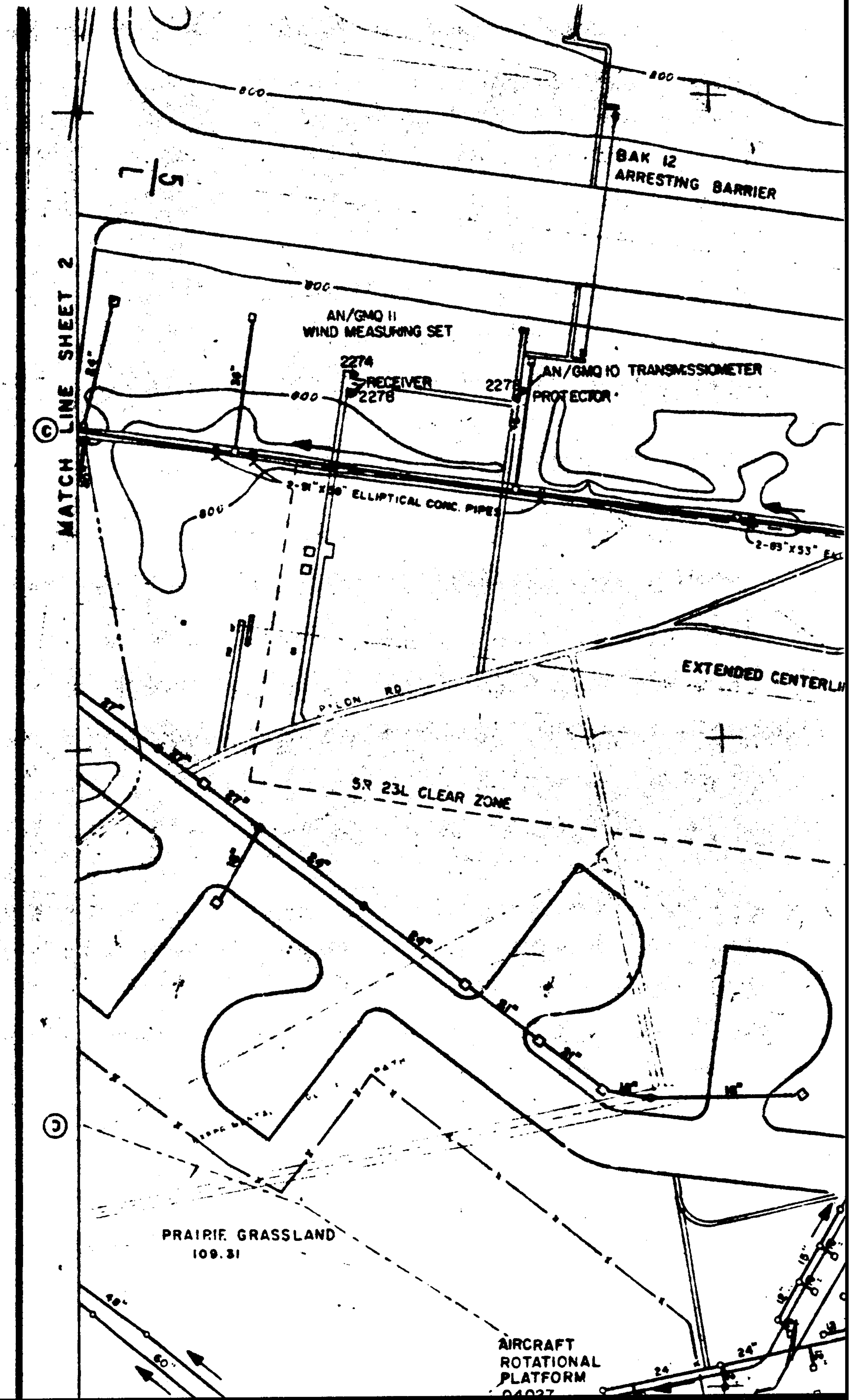


5420

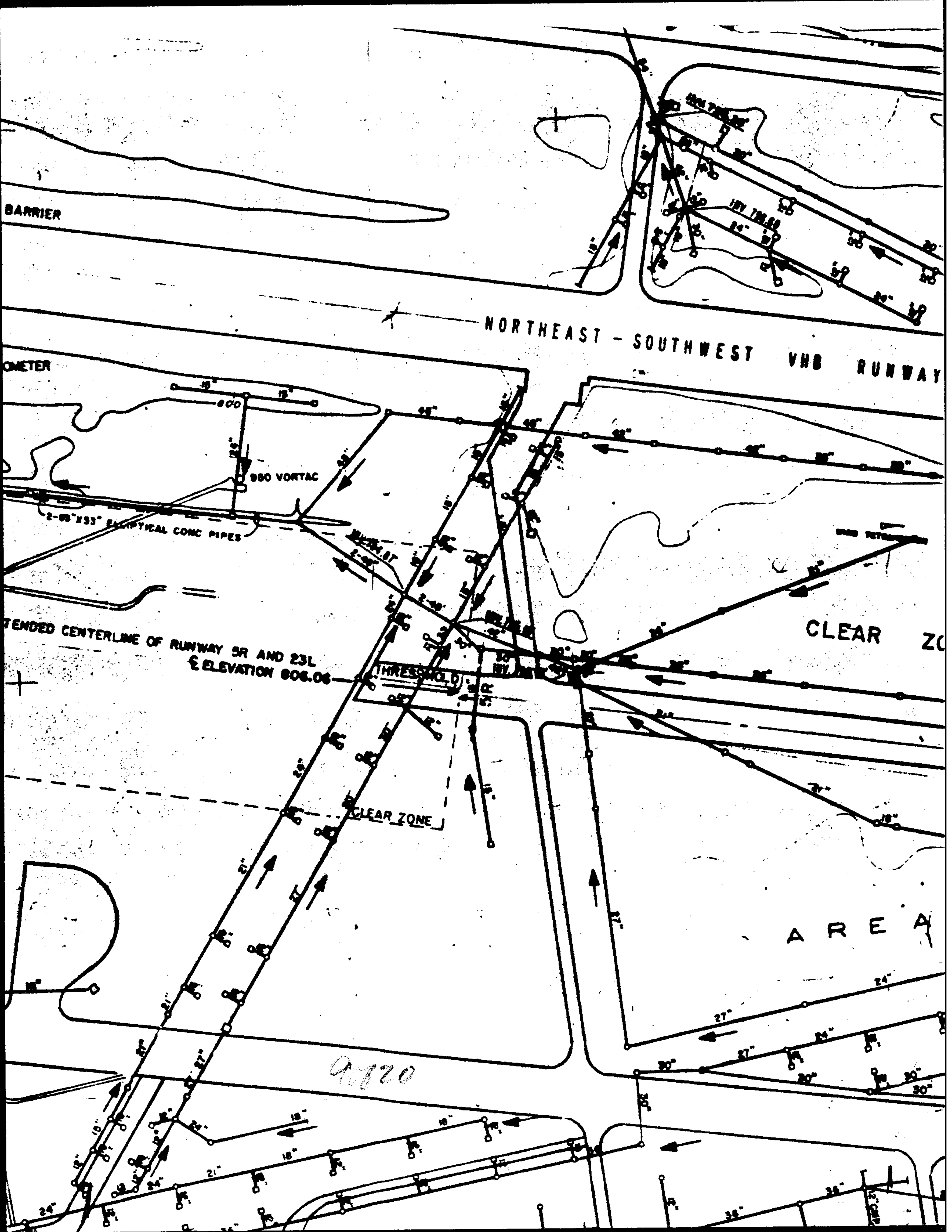

CLARK COUNTY
GREENE COUNTY
MUD
RUN
GRAVEL LAKE
GRAVEL
STATE ROUTE NO. 235
SURVIVAL TRAINING
36" X 60" ELLIPTICAL
ARNOLD
TENNIS COURT
4005
4006
4034
4002
DOUGLAS
FLECTORS
36"
30"
18"
12"

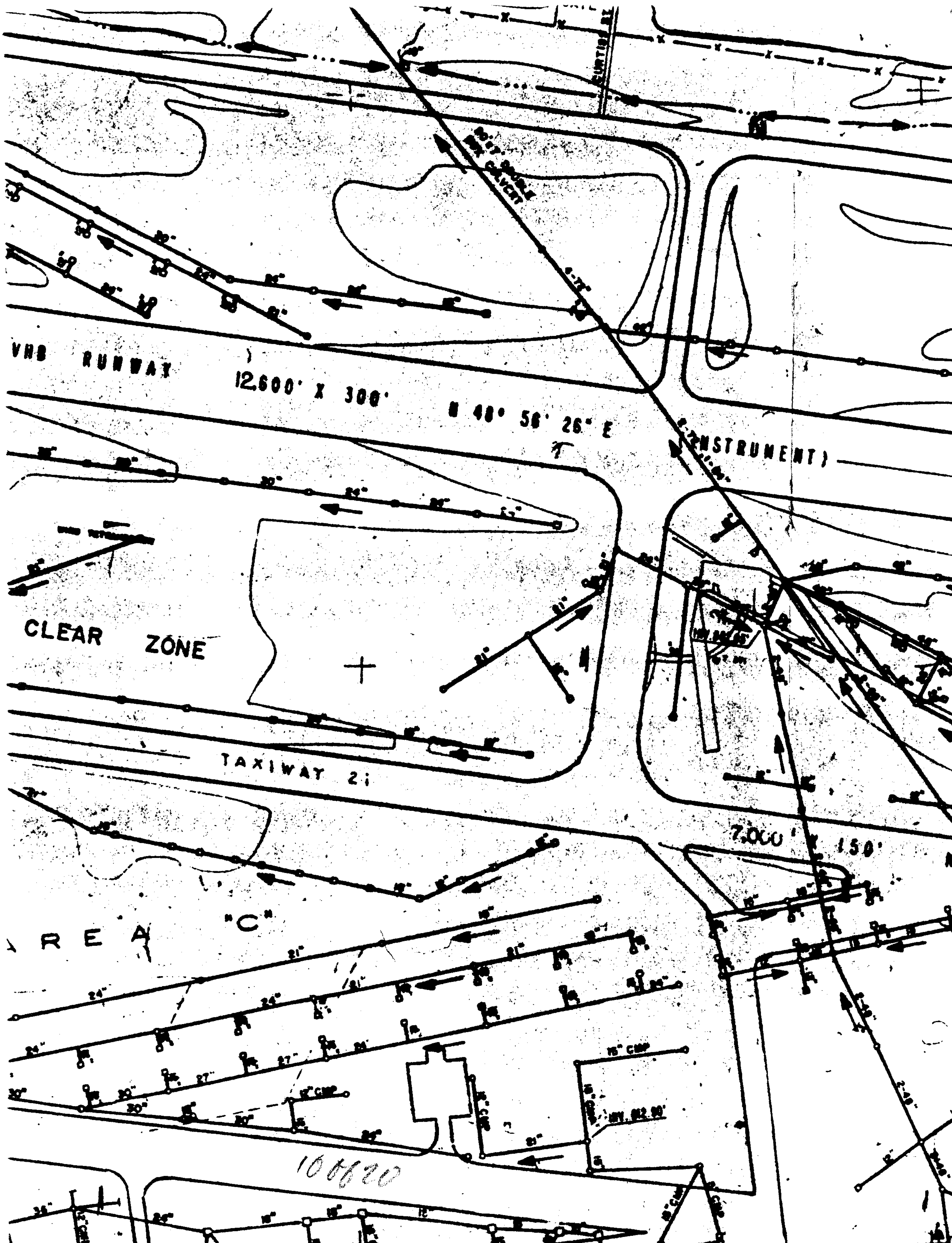
6090


CLARK COUNTY
GREENE COUNTY
A
B
RUN
RAVEL
LEGEND
BUILDINGS & STRUCTURES
PERMANENT
SEMI-PERMANENT
TEMPORARY
PROPOSED
UNDERGROUND
OTHER THAN MILITARY
TO BE REMOVED
AIRFIELD PAVEMENT
EXISTING
ABANDONED
ROADS & PARKING
SURFACED
UNIMPROVED
℄ PROPOSED ROADS
70820

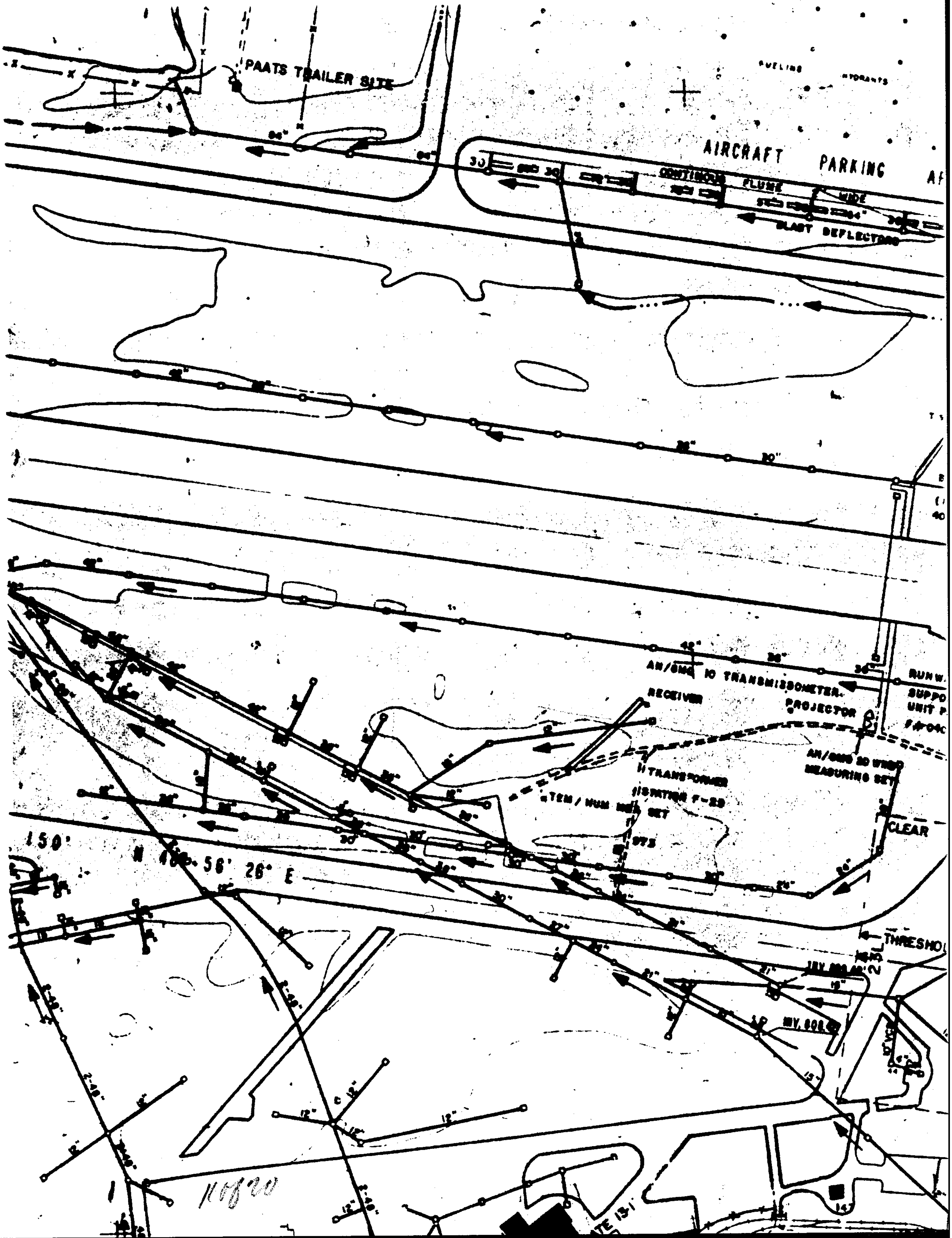


BAK 12
ARRESTING BARRIER
MATCH LINE SHEET 2
AN/GMQ 11
WIND MEASURING SET
2274
RECEIVER
2278
AN/GMQ 10 TRANSMISSIOMETER
PROTECTOR
ELLIPTICAL CONC. PIPES
PYLON RD
S.R. 23L CLEAR ZONE
PRAIRIE GRASSLAND
109.31
AIRCRAFT
ROTATIONAL
PLATFORM

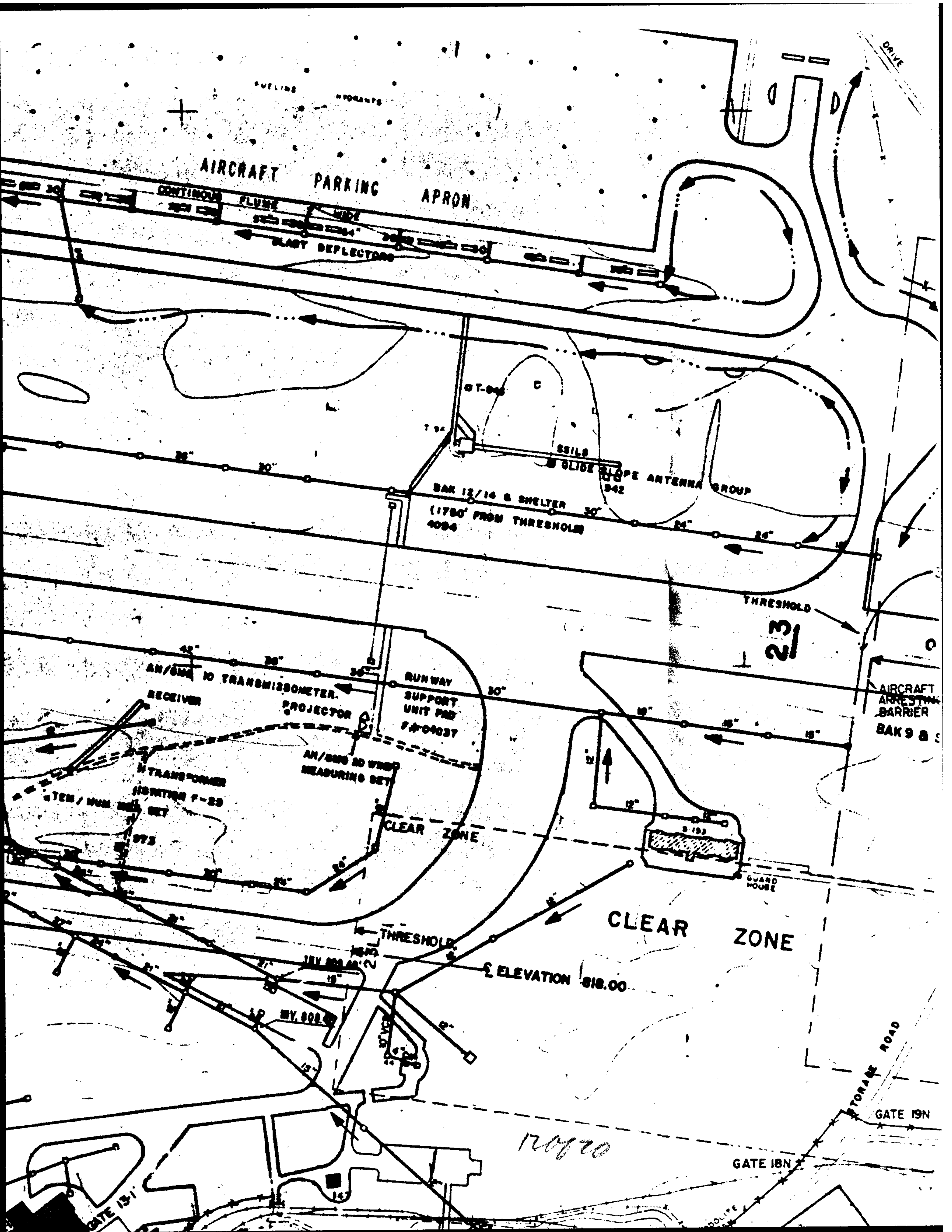

BARRIER
NORTHEAST - SOUTHWEST VHB RUNWAY
OMETER
950 VORTAC
2-66"X53" ELLIPTICAL CONC PIPES
TENDED CENTERLINE OF RUNWAY 5R AND 23L
℄ ELEVATION 806.06
THRESHOLD
CLEAR ZONE
CLEAR ZO
AREA



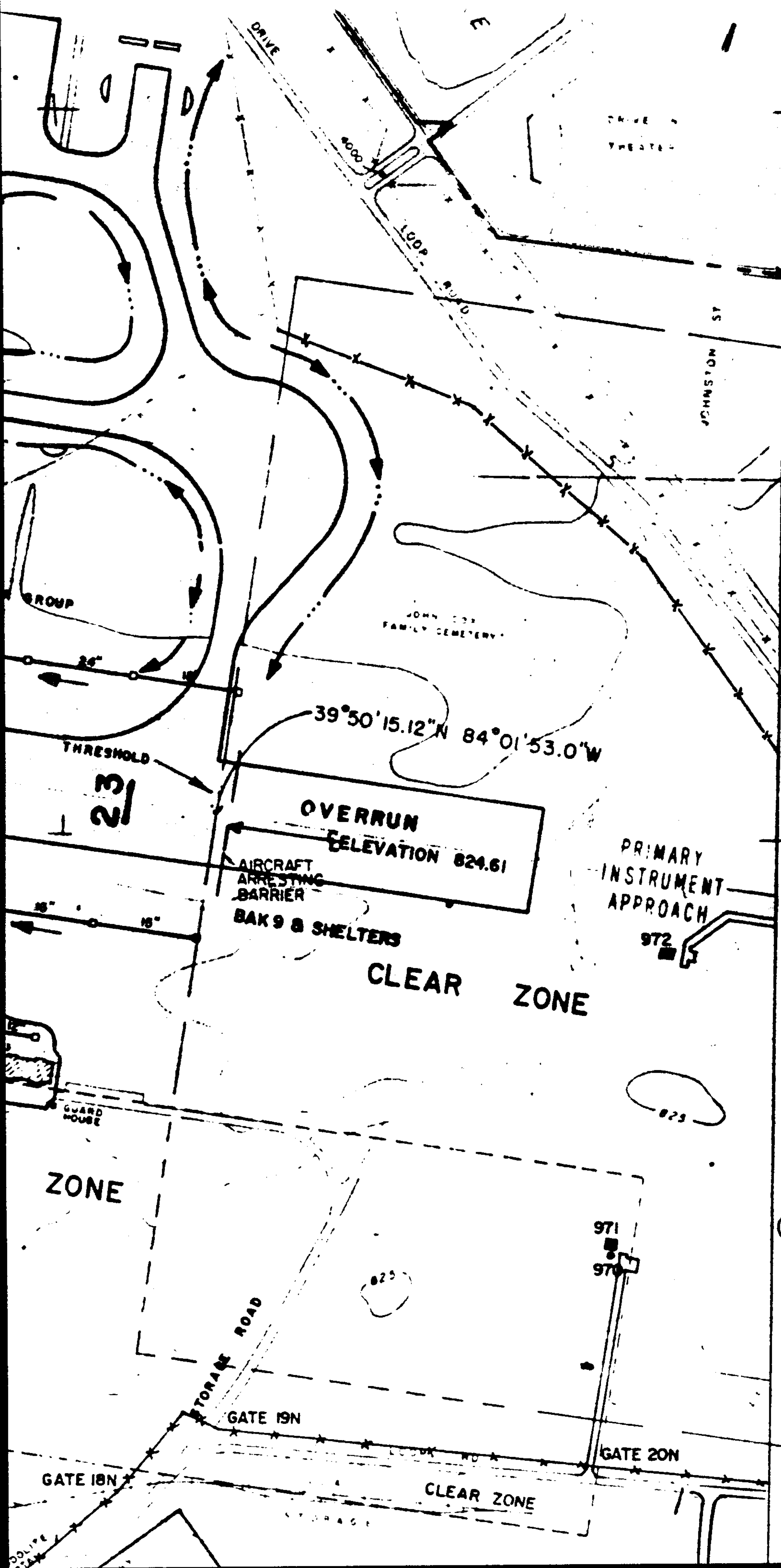
RUNWAY
12,600' X 300'
N 48° 56' 26" E
(INSTRUMENT)
CLEAR ZONE
TAXIWAY 21
7,000' X 150'
AREA "C"
CURTISS ST
15" CMP
12" CMP
INV. 802.90'
100820



PAATS TRAILER SITE
FUELING
HYDRANTS
AIRCRAFT PARKING
CONTINUOUS FLUME
BLAST DEFLECTORS
AN/GMQ 10 TRANSMISSOMETER
RECEIVER
PROJECTOR
AN/GMQ 20 WIND MEASURING SET
TRANSFORMER STATION F-23
CLEAR
THRESHO



FUELING HYDRANTS
AIRCRAFT PARKING APRON
CONTINUOUS FLUME
BLAST DEFLECTORS
DRIVE
SSILS
GLIDE SLOPE ANTENNA GROUP
942
BAK 12/14 & SHELTER
(1750' FROM THRESHOLD)
4094
THRESHOLD
23
AIRCRAFT ARRESTING BARRIER
BAK 9 &
AN/GMQ 10 TRANSMISSOMETER
RECEIVER
PROJECTOR
RUNWAY SUPPORT UNIT PAD
AN/GMQ 20 WIND MEASURING SET
TRANSFORMER
CLEAR ZONE
GUARD HOUSE
CLEAR ZONE
THRESHOLD
ELEVATION 818.00
STORAGE ROAD
GATE 19N
GATE 18N
GATE 13
12070



GENERAL

RESERVATION BOUNDARY

PROPOSED BOUNDARY

FENCE

RAILROAD

DRAINAGE DITCH

STREAM OR RIVER

BERM OR LEVEE

RETAINING WALL

EASEMENT

STORM DRAINAGE SYSTEM

18" PIPE WITH SIZE

MANHOLE

INV 796.80' MANHOLE WITH KEY INVER

CATCH BASIN OR INLET

CULVERT

CONCRETE DRAIN OR PAVEI

FRENCH DRAIN

HEADWALLS

DIRECTION OF FLOW

EXISTING FACILITY TO BE

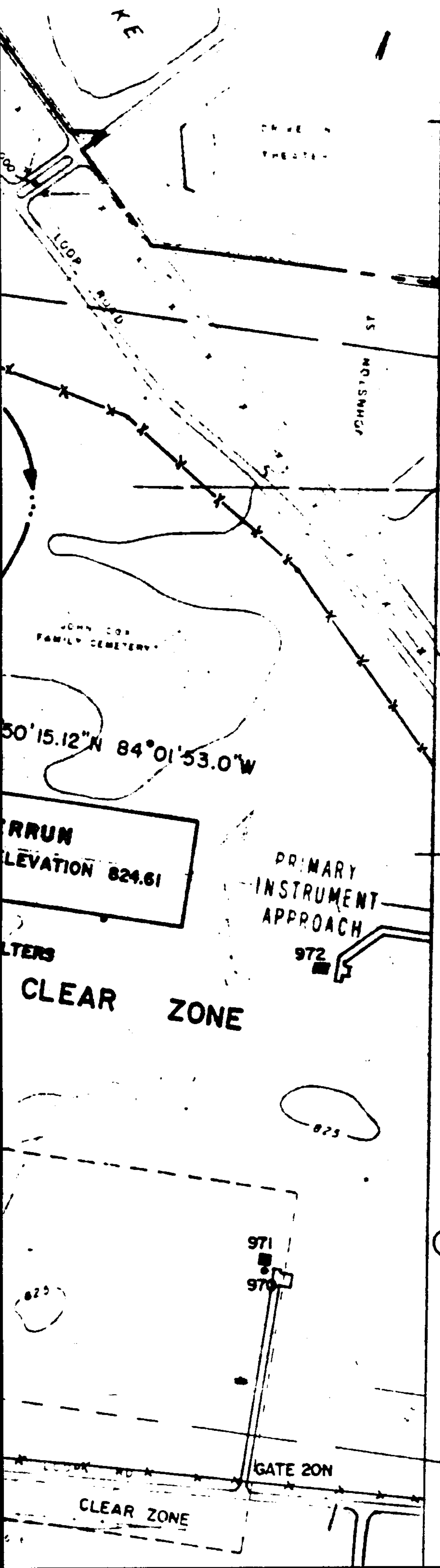
72" PROPOSED STORM SEWER CULVERT (WITH SIZE)

130820

NOTES:

1. ALL PIPE IS CONCRETE UNLESS OTHERWISE N BY: CIP – CAST IRON PIPE
CMP – CORRUGATED METAL PIPE
VCP – VITRIFIED CLAY PIPE

2. MAGNETIC DECLINATION & ANNUAL CHA



GENERAL

RESERVATION BOUNDARY

PROPOSED BOUNDARY

FENCE

RAILROAD

DRAINAGE DITCH

STREAM OR RIVER

BERM OR LEVEE

RETAINING WALL

EASEMENT

STORM DRAINAGE SYSTEM

15" PIPE WITH SIZE

MANHOLE

INV 796.90' MANHOLE WITH KEY INVERT

CATCH BASIN OR INLET

CULVERT

CONCRETE DRAIN OR PAVED DITCH

FRENCH DRAIN

HEADWALLS

DIRECTION OF FLOW

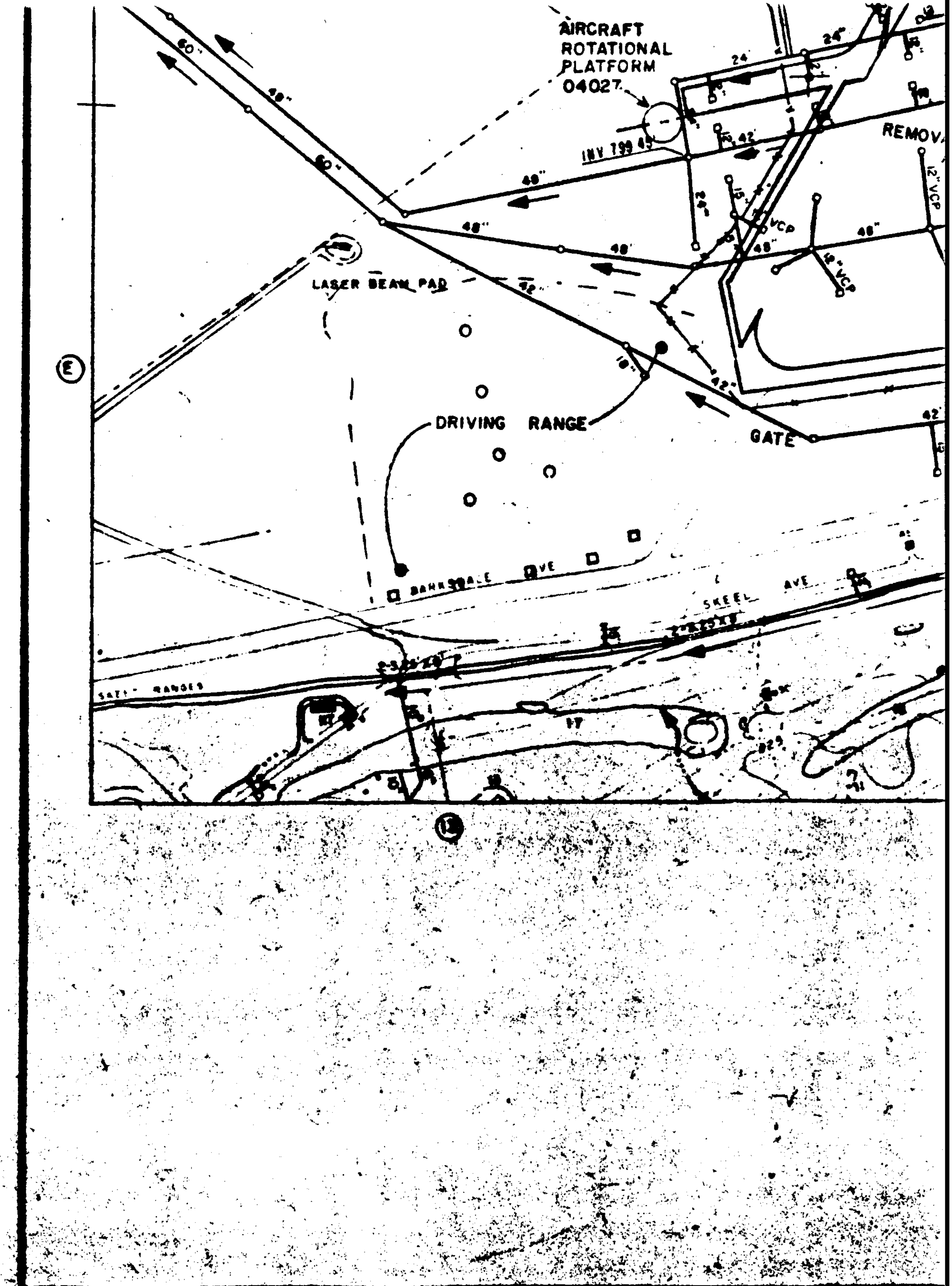
EXISTING FACILITY TO BE ABANDONED

72" PROPOSED STORM SEWER OR CULVERT (WITH SIZE)

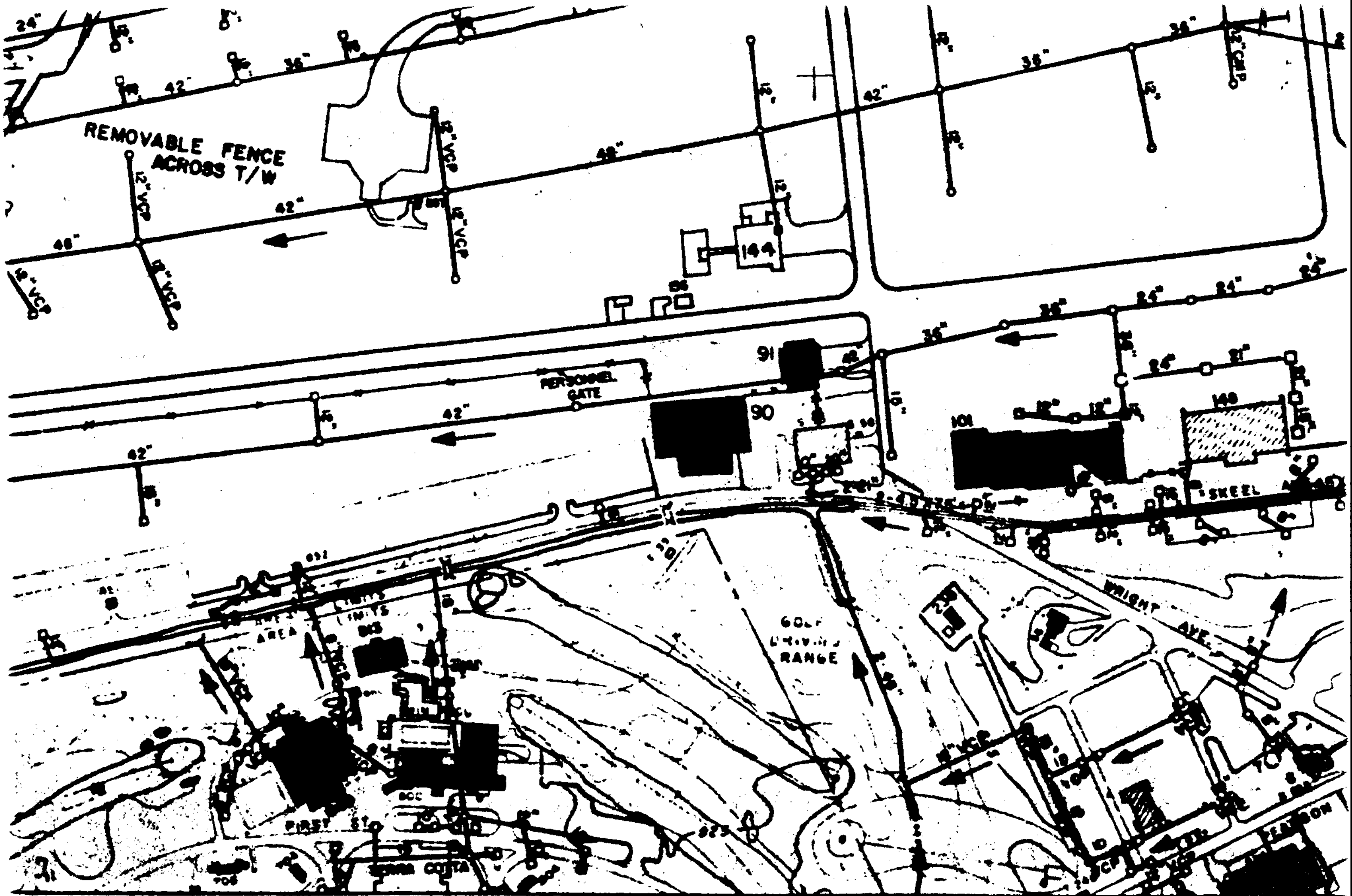
140620

NOTES:

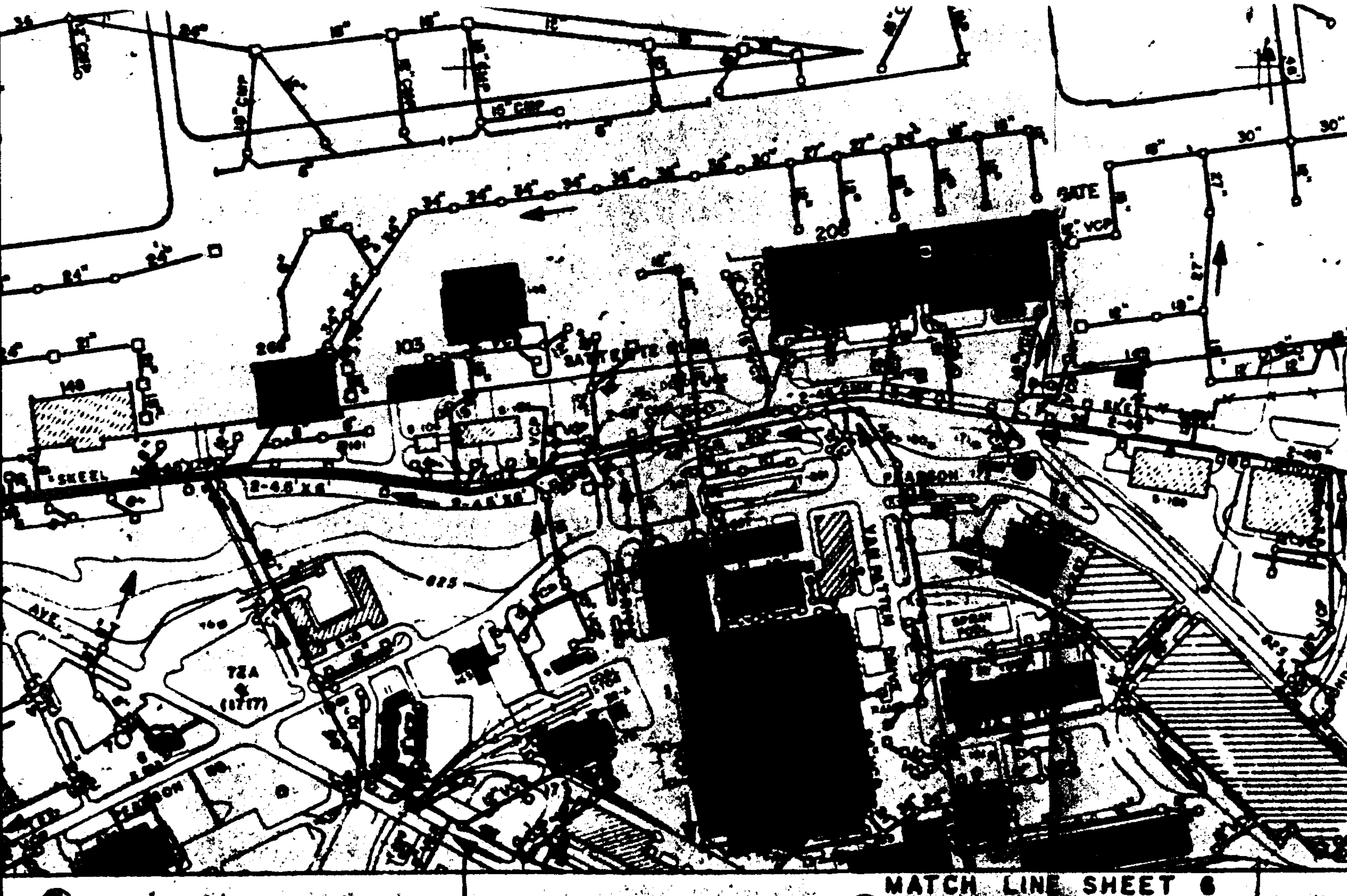
1. ALL PIPE IS CONCRETE UNLESS OTHERWISE NOTED BY: CIP — CAST IRON PIPE
   CMP — CORRUGATED METAL PIPE
   VCP — VITRIFIED CLAY PIPE
2. MAGNETIC DECLINATION & ANNUAL CHANGE


AIRCRAFT
ROTATIONAL
PLATFORM
04027
REMOV
LASER BEAM PAD
DRIVING RANGE
GATE
SKEEL AVE

15620

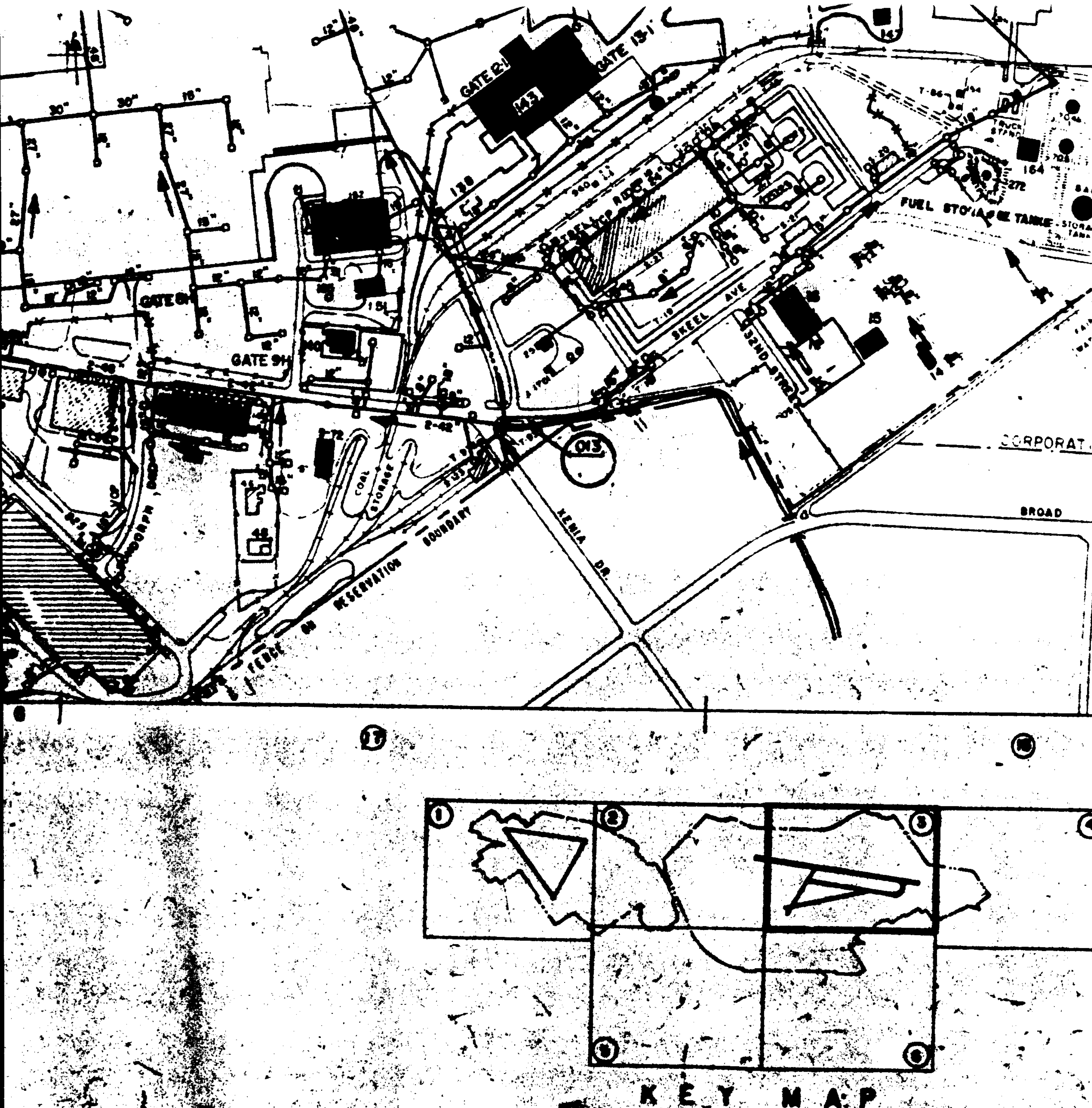

REMOVABLE FENCE
ACROSS T/W
144
PERSONNEL GATE
91
90
101
148
WRIGHT AVE.
RANGE
FIRST ST.

160800



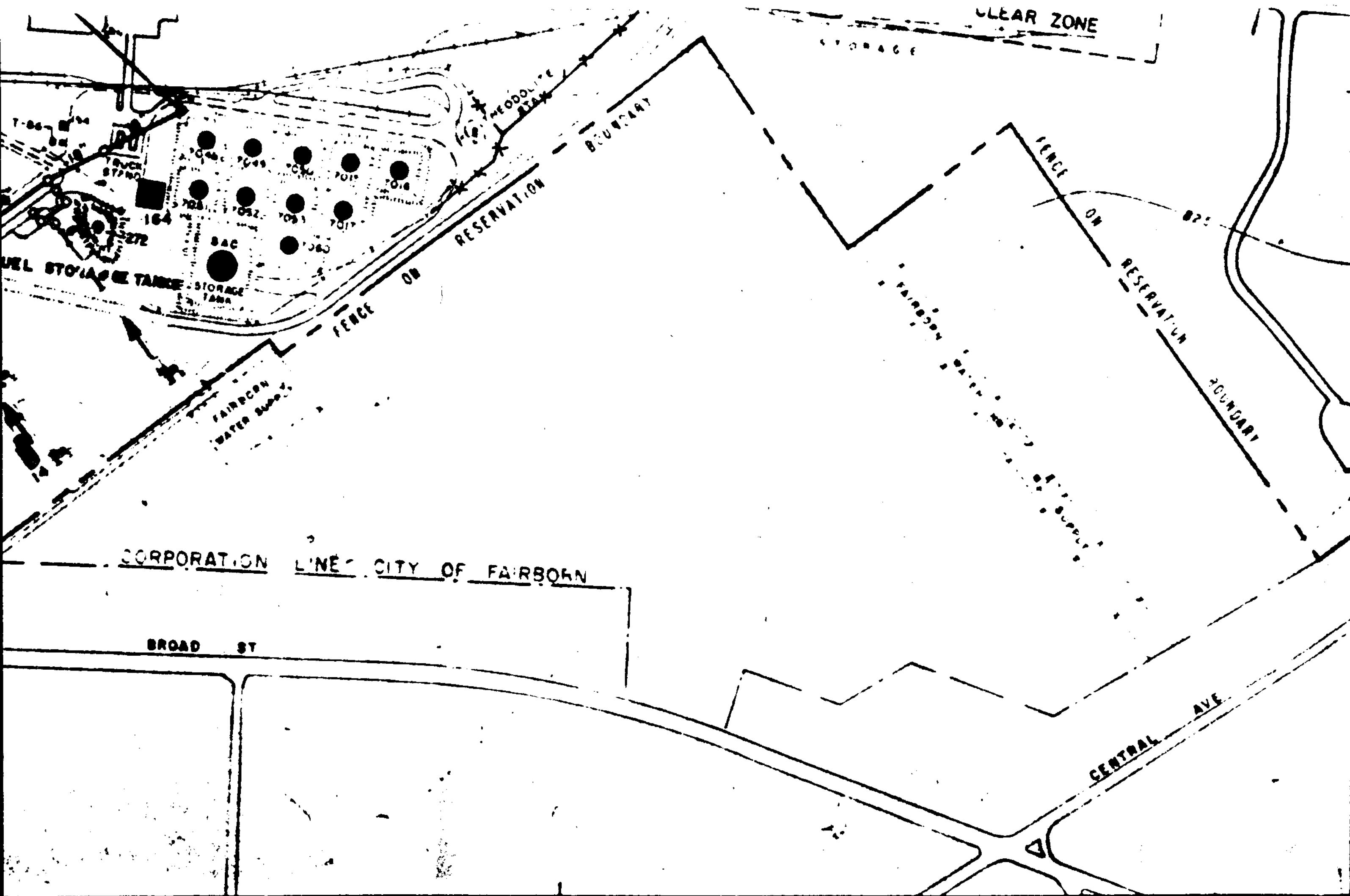
FOR OFFICIAL U

170820

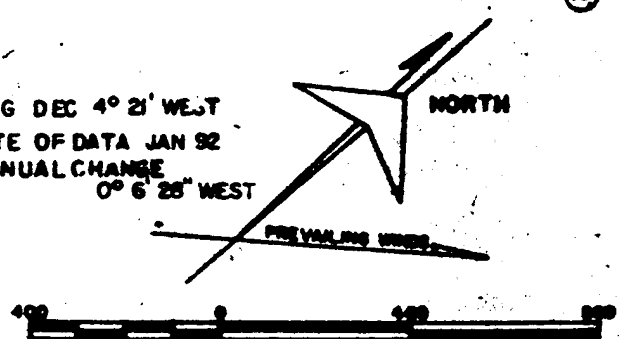


FICIAL USE ONLY (AFR 11-30)

18820



MAG DEC 4° 21' WEST
DATE OF DATA JAN 92
ANNUAL CHANGE
0° 6' 28" WEST



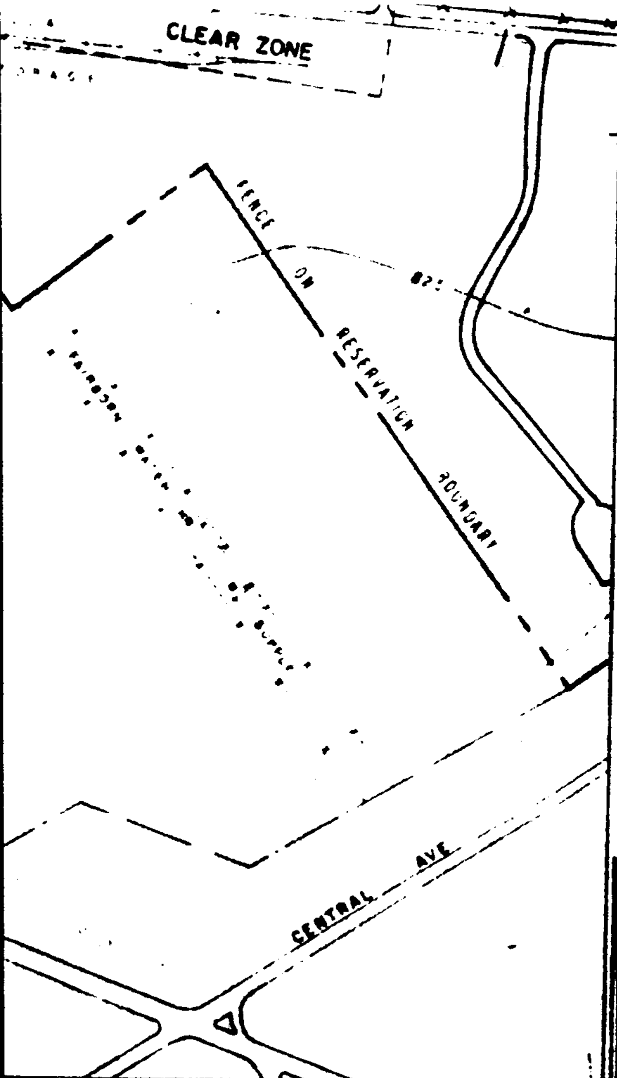
SCALE IN FEET
AIRFIELD ELEVATION 824 FEET

REV	DATE	DESCRIPTION	INITIAL
5	AUG 80	REVISIONS	DWS
7	2/2/79	GEN UPDATE	DRS

PLAN REVISIONS

DEP
DIRECTORA
HEAD
ST
WRIGH
SCALE: IIN
CONTRACT
LEO A. D
OMAHA - ST. LO

19 of 20



VCP - VITRIFIED CLAY PIPE

2. MAGNETIC DECLINATION & ANNUAL CHANGE

3. NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM SAMPLING POINTS (NPDES)

DISCHARGE S/N	SITE LOCATION		LOCAL
005	39° 49' 41"	84° 02' 58"	
006	39° 50' 17"	84° 02' 23"	
	39° 49' 36"	84° 0[illegible] 15"	#C13

Ⓔ

10	9-30-92	ANNUAL REVISION UPDATE	JRH
9	9-30-91	ANNUAL REVISION UPDATE	RLB
8	9-30-90	ANNUAL REVISION UPDATE	JRH
7	9-30-89	ANNUAL REVISION UPDATE	JRH
6	9-30-88	ANNUAL REVISION UPDATE	JRH
5	9.30.87	ANNUAL REVISION UPDATE	JRH
4	FEB 82	GENERAL REVISIONS	E. S.

NORTH

824 FEET

	DWS
	DRS
	INITIAL

DEPARTMENT OF THE AIR FORCE

DIRECTORATE OF CIVIL ENGINEERING DCS/P&R - WASHINGTON, D.C.

HEADQUARTERS AIR FORCE LOGISTICS COMMAND

MASTER PLAN

STORM DRAINAGE SYSTEM

WRIGHT-PATTERSON AIR FORCE BASE

FAIRBORN, OHIO

SCALE: 1 INCH = 400 FT. DATE: 1 MAY 1969

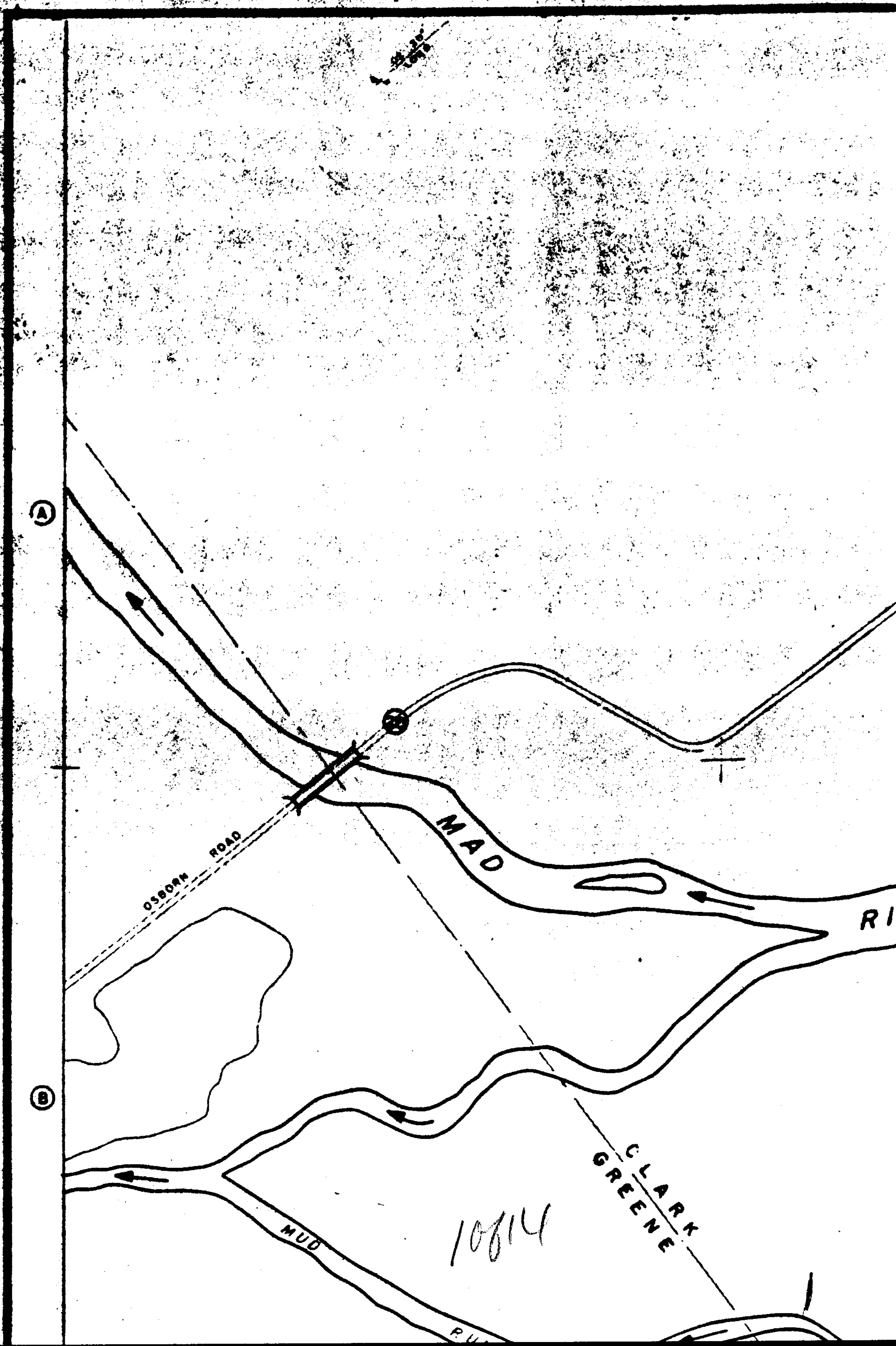
CONTRACT NO. F 33601-67-C-0170

TAB NO. G-3

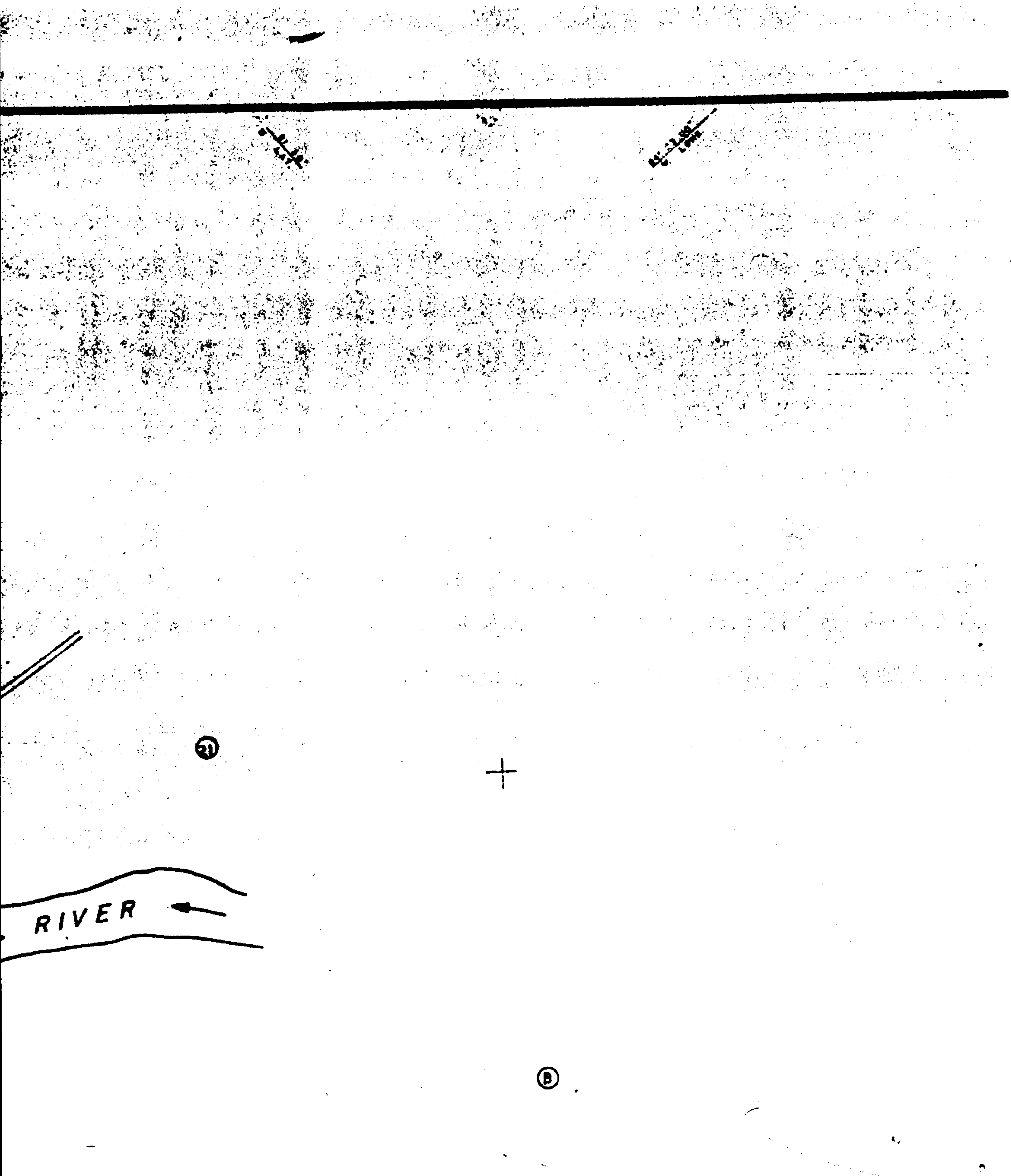
LEO A. DALY CO. ARCHITECTS ENGINEERS PLANNERS
OMAHA - ST. LOUIS - SEATTLE - SAN FRANCISCO - NEW ORLEANS

SHEET 3 OF 6

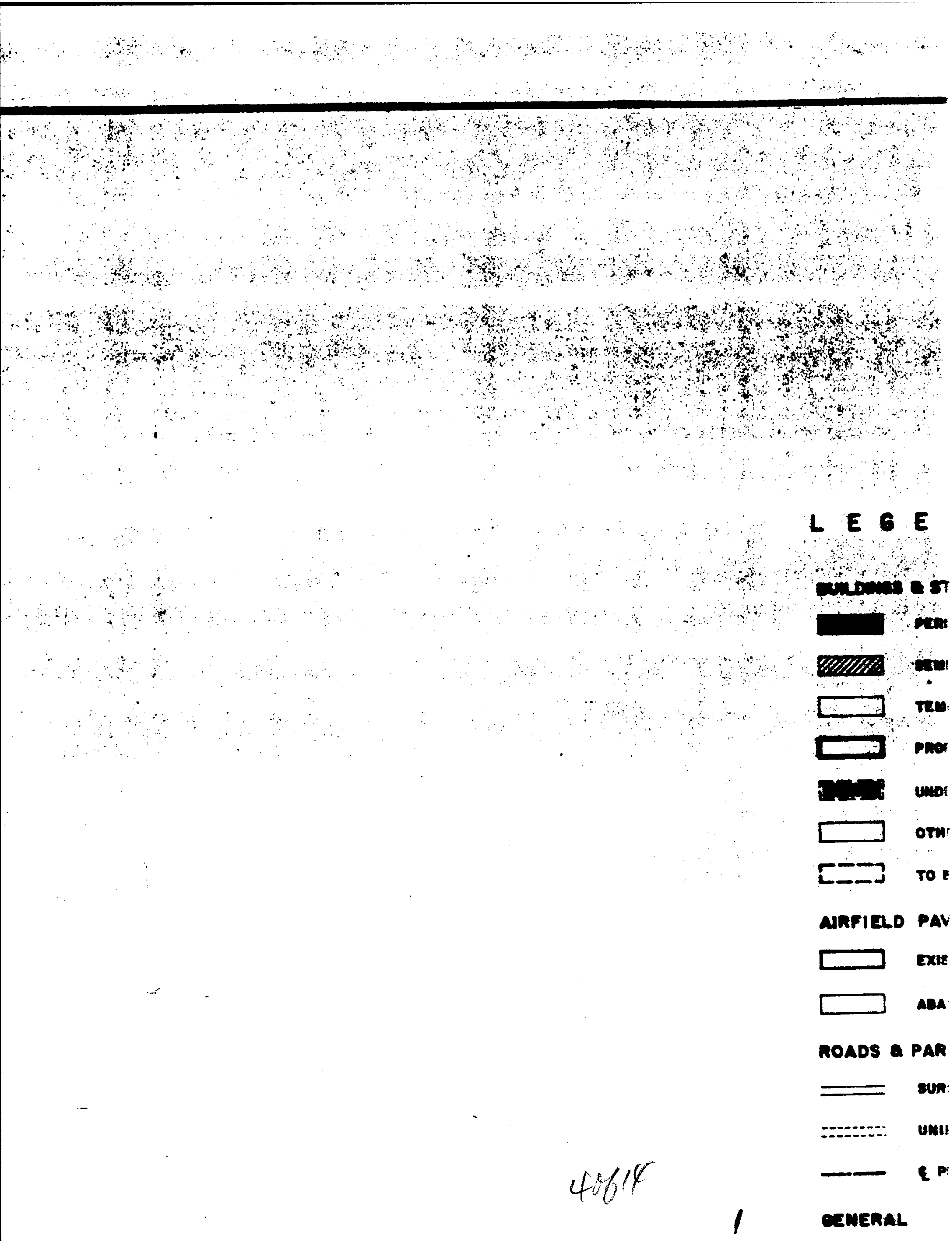
-208820



A
B
OSBORN ROAD
MAD
RI
CLARK
GREENE
MUD
10814



20814 1


L E G E
AIRFIELD PAV
ROADS & PAR
GENERAL
40614

L E G E N D

BUILDINGS & STRUCTURES

- PERMANENT
- SEMI-PERMANENT
- TEMPORARY
- PROPOSED
- UNDERGROUND
- OTHER THAN MILITARY
- TO BE REMOVED

AIRFIELD PAVEMENT

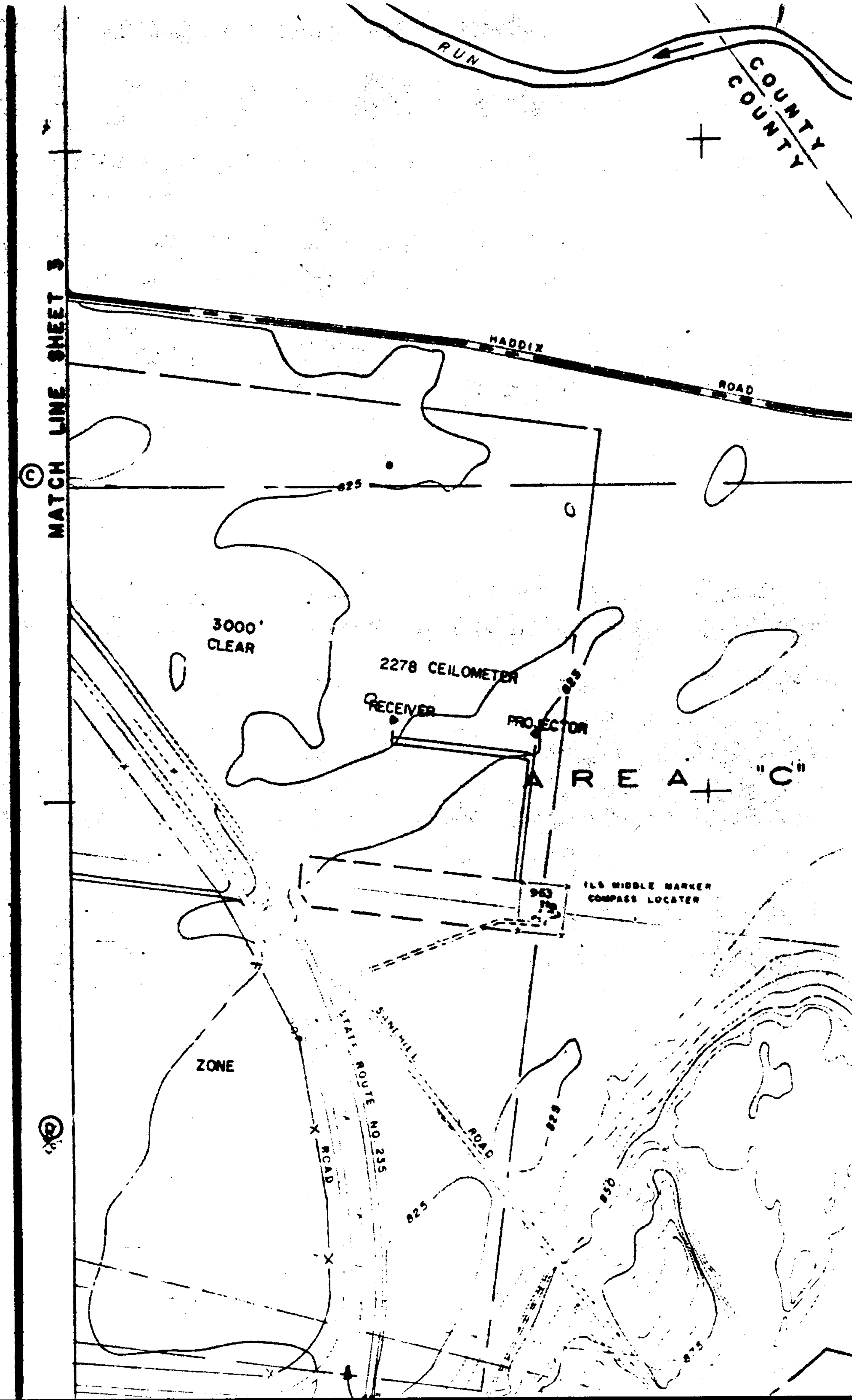
- EXISTING
- ABANDONED

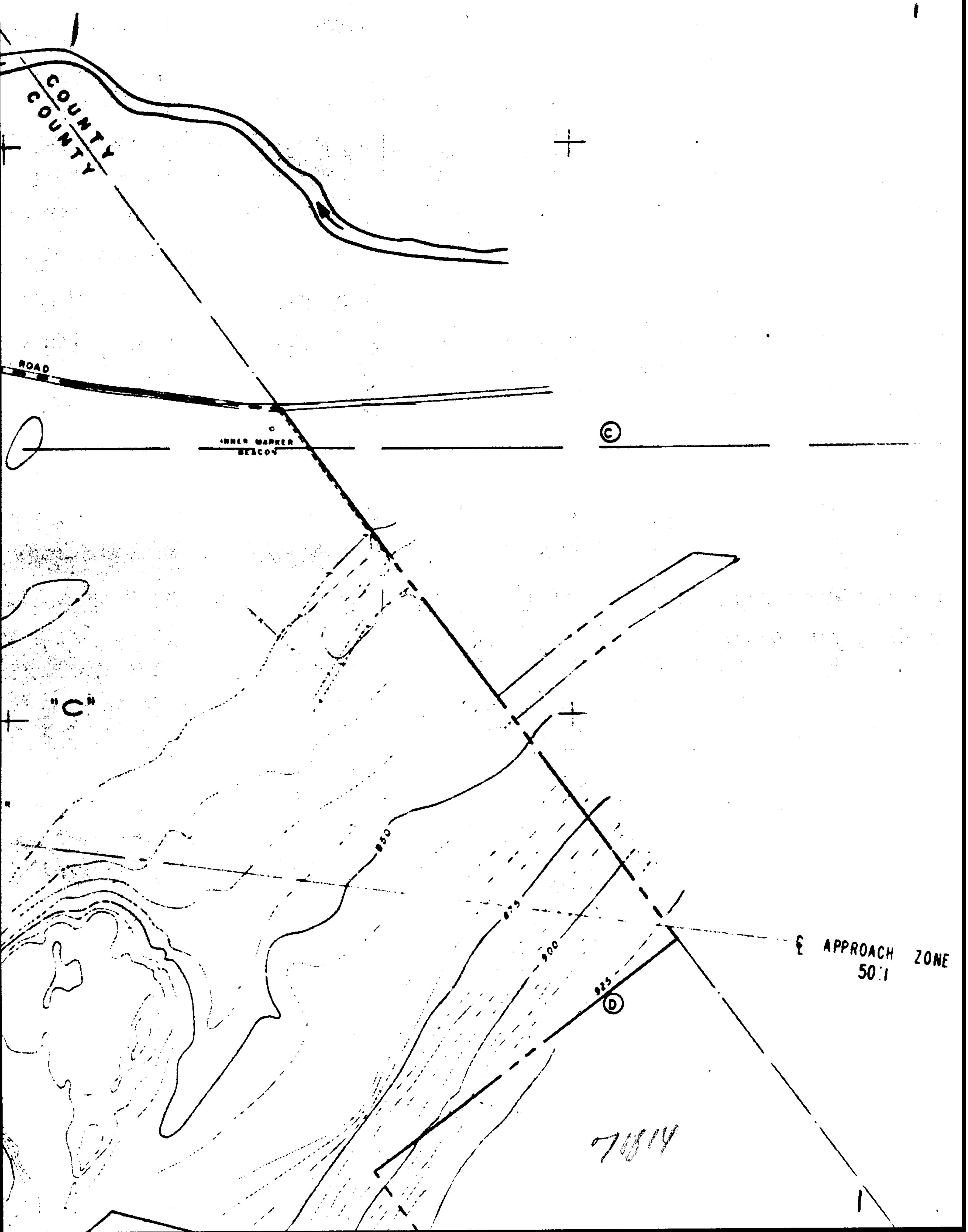
ROADS & PARKING

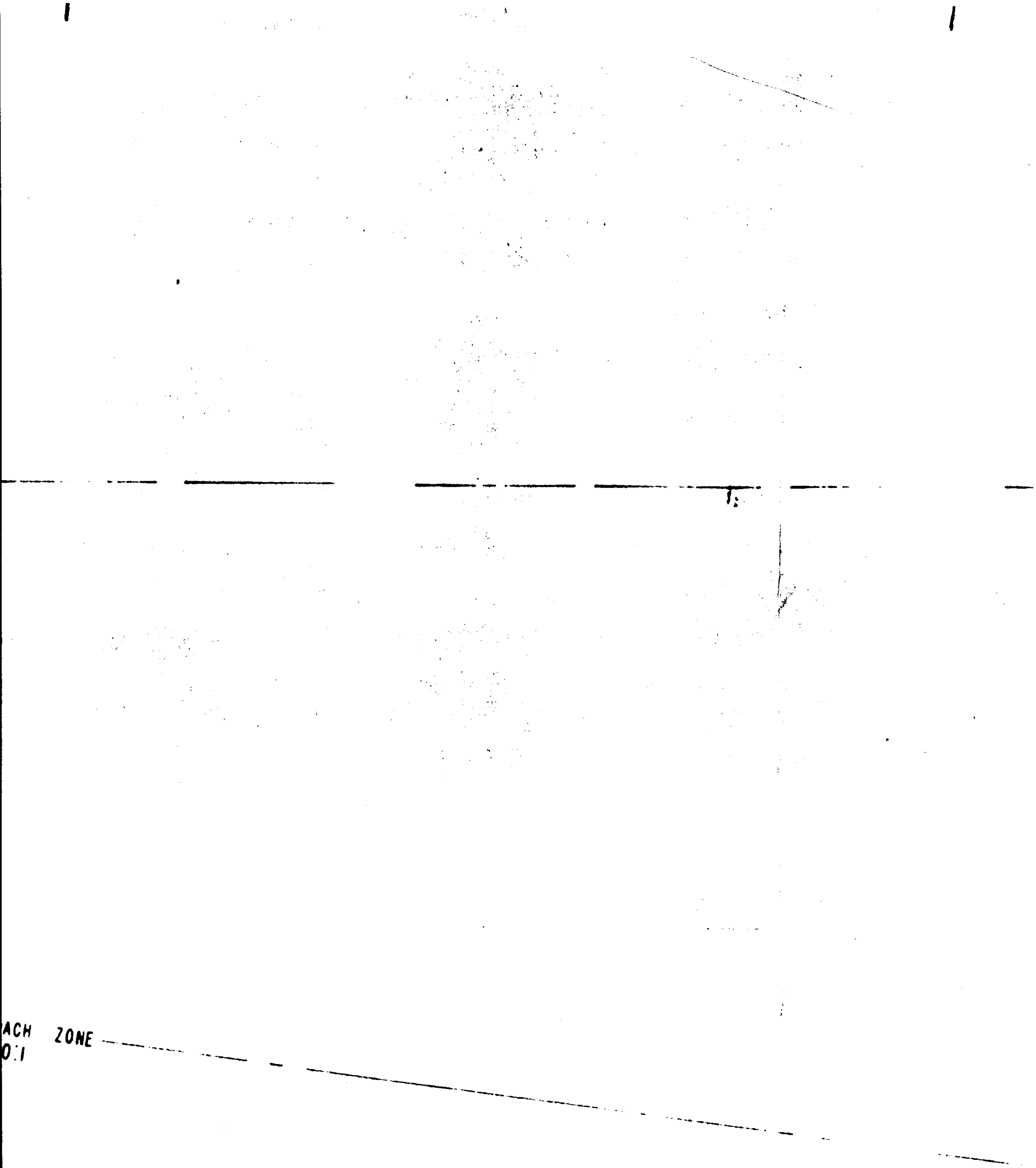
- SURFACED
- UNIMPROVED
- ℄ PROPOSED ROADS

5 of 11

GENERAL


RUN
COUNTY
COUNTY
MATCH LINE SHEET 5
HADDIX
ROAD
825
3000'
CLEAR
2278 CEILOMETER
RECEIVER
PROJECTOR
825
AREA "C"
ILS MIDDLE MARKER
COMPASS LOCATER
ZONE
STATE ROUTE NO 235
ROAD
ROAD
825
825
850
875


1
COUNTY
COUNTY
ROAD
INNER MARKER BEACON
C
"C"
850
875
900
925
D
℄ APPROACH ZONE
50:1
1



8/9/10

GENERAL

RESERVATION BOUNDARY

PROPOSED BOUNDARY

FENCE

RAILROAD

DRAINAGE DITCH

STREAM OR RIVER

BERM OR LEVEE

RETAINING WALL

EASEMENT

STORM DRAINAGE SYSTEM

18" PIPE WITH SIZE

MANHOLE

INV. 790.00' MANHOLE WITH KEY INVERT

CATCH BASIN OR INLET

CULVERT

CONCRETE DRAIN OR PAVED DITCH

FRENCH DRAIN

HEADWALLS

DIRECTION OF FLOW

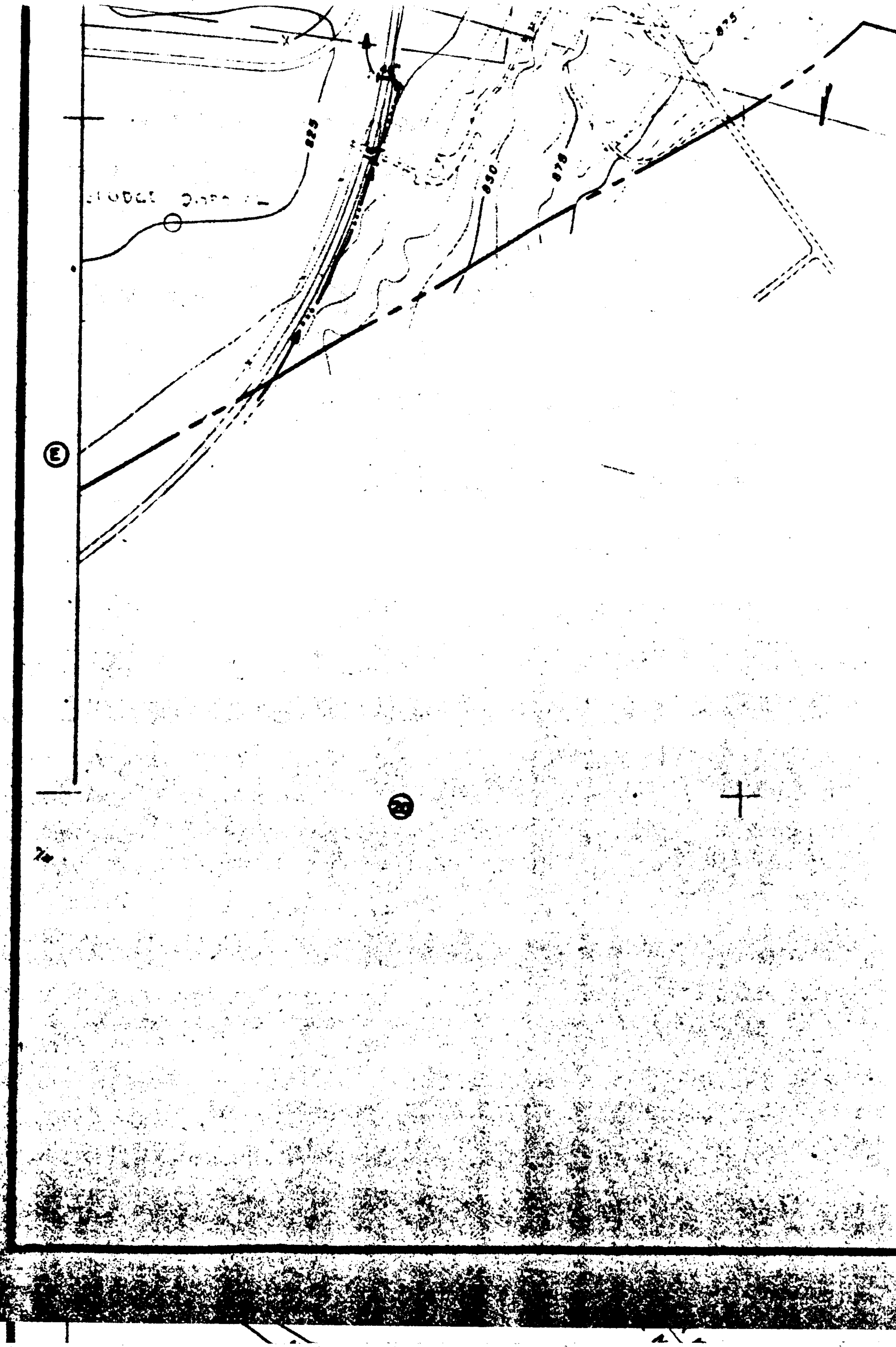
EXISTING FACILITY TO BE ABANDONED

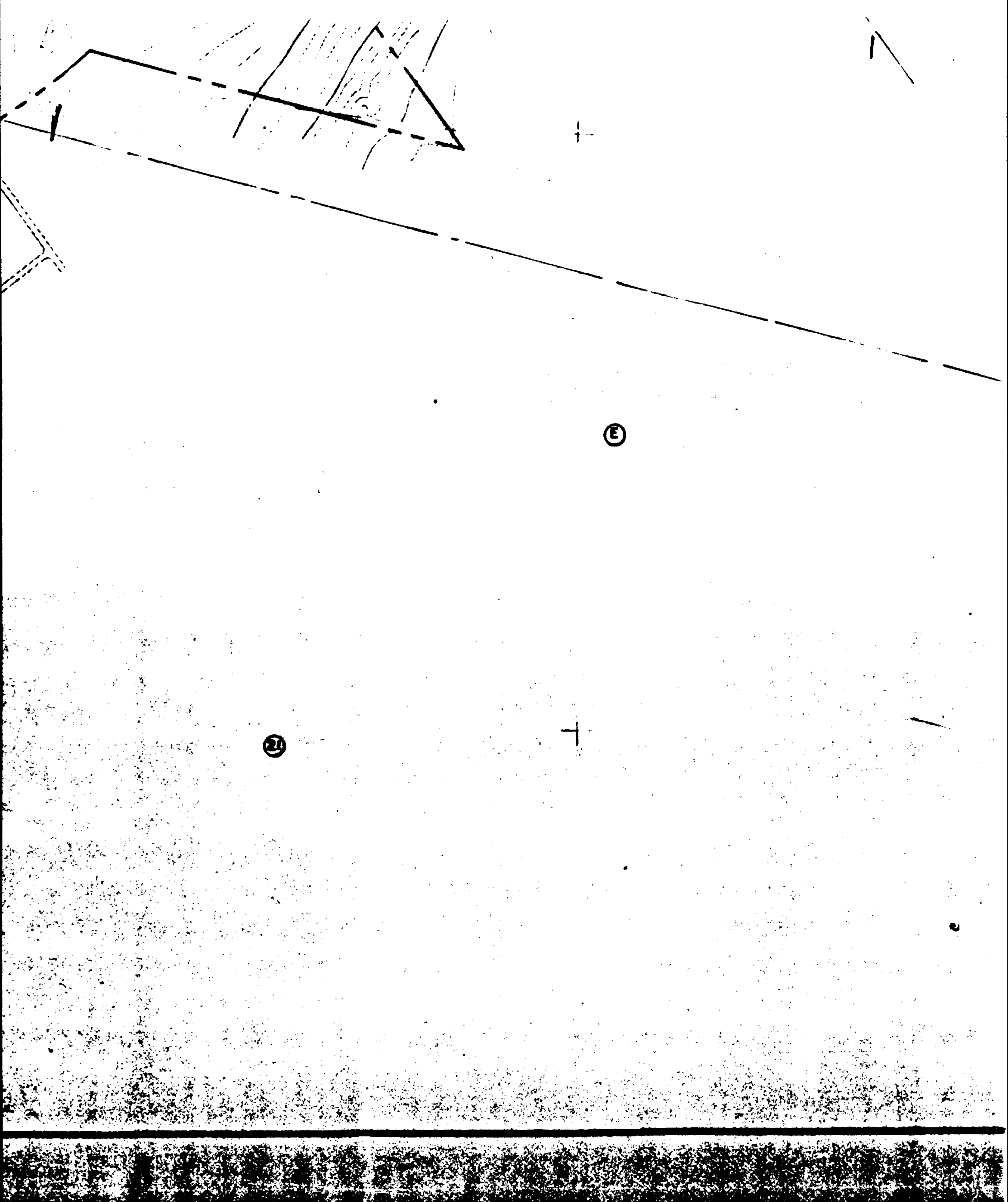
72" PROPOSED STORM SEWER OR CULVERT (WITH SIZE)

9068

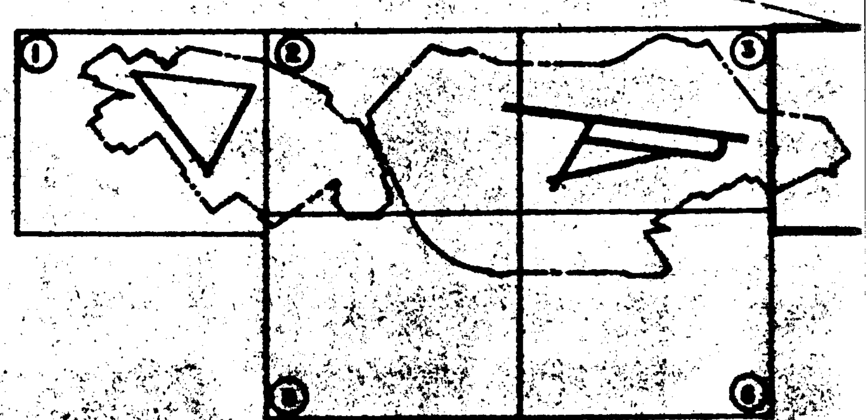
NOTES:

1. ALL PIPE IS CONCRETE UNLESS OTHERWISE NOTED
   BY: CIP — CAST IRON PIPE
   CMP — CORRUGATED METAL PIPE
   VCP — VITRIFIED CLAY PIPE


825
850
875
E
20

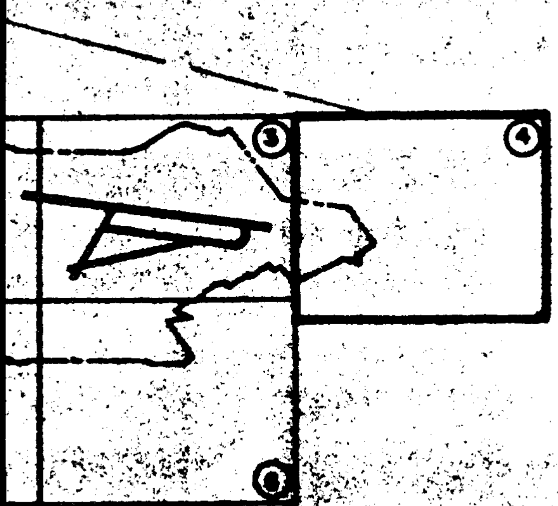


11 of 14



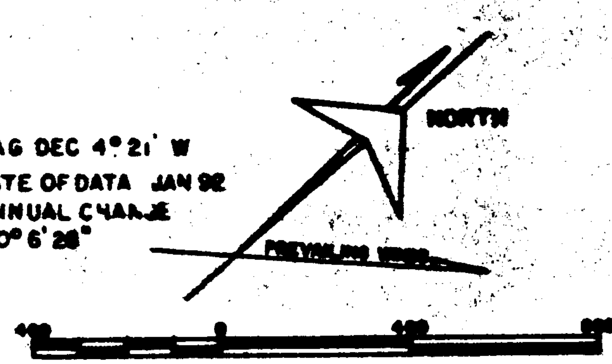
KEY MAP

R0814



M A P 1

MAG DEC 4° 21' W
DATE OF DATA JAN 92
ANNUAL CHANGE
0° 6' 28"



SCALE IN FEET
AIRFIELD ELEVATION 824 FEET

REV	DATE	DESCRIPTION	INITIAL
3	AUG 80	REVISION	DWS
2	2/2/79	GEN. UPDATE	DRS

PLAN REVISIONS

13814

BY: CIP — CAST IRON PIPE
CMP — CORRUGATED METAL PIPE
VCP — VITRIFIED CLAY PIPE

11	9-30-92	ANNUAL REVISION UPDATE	JRH
10	9-30-91	ANNUAL REVISION UPDATE	EGO
9	9-30-90	ANNUAL REVISION UPDATE	JRH
8	9-30-89	ANNUAL REVISION UPDATE	JRH
7	9-30-88	ANNUAL REVISION UPDATE	JRH
6	9-30-87	ANNUAL REVISION UPDATE	JRH
5	2-08-84	YEARLY UPDATE	RDH
4	FEB 82	GENERAL REVISION	E.S.

NORTH

400 800

EET
824 FEET

	DWS
	DRS
ION	INITIAL

IONS

DEPARTMENT OF THE AIR FORCE

DIRECTORATE OF CIVIL ENGINEERING DCS/P & R — WASHINGTON, D.C.

HEADQUARTERS AIR FORCE LOGISTICS COMMAND

MASTER PLAN

STORM DRAINAGE SYSTEM

WRIGHT - PATTERSON AIR FORCE BASE

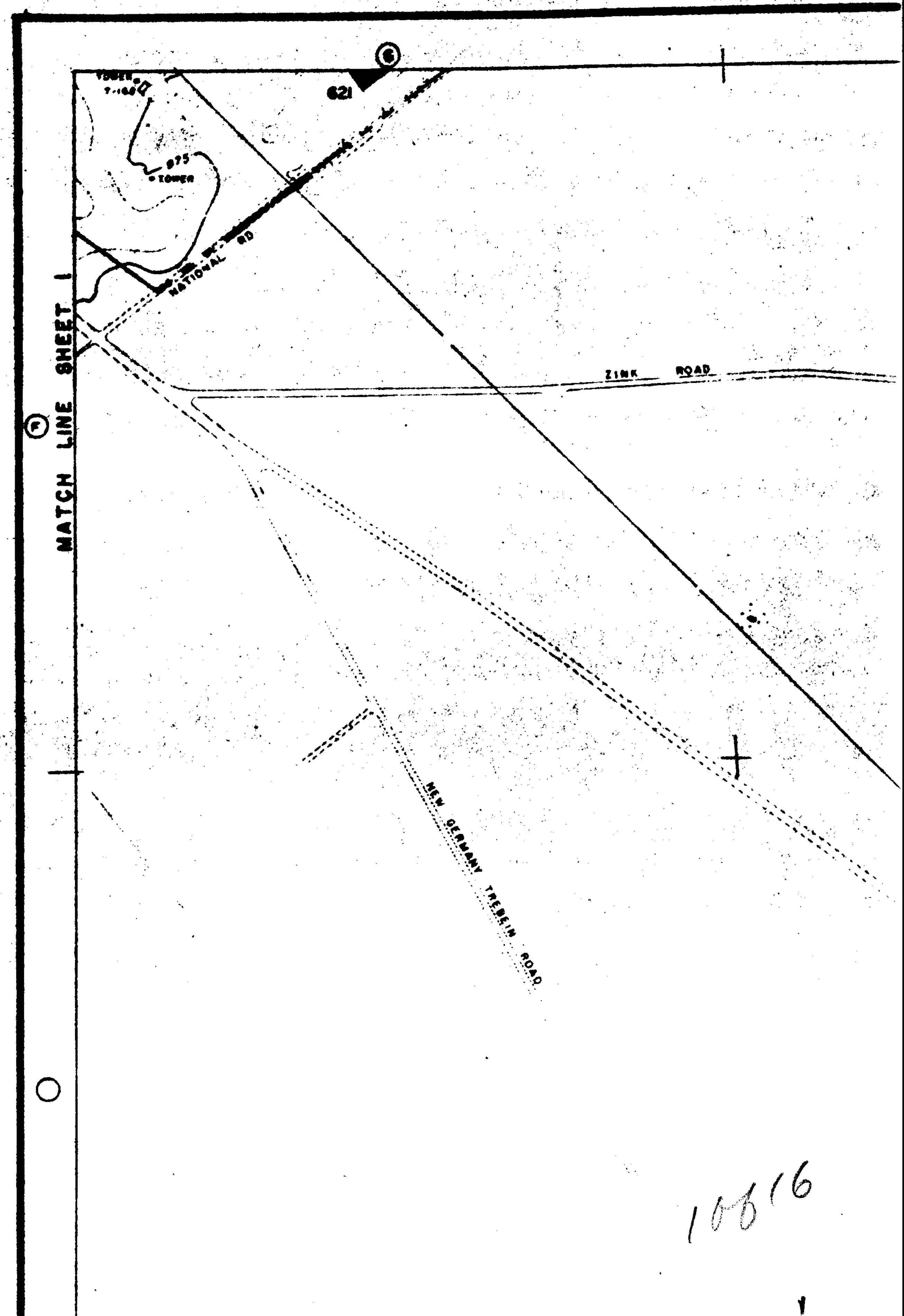
FAIRBORN, OHIO

SCALE: 1 INCH = 400 FT	DATE: 1 MAY 1969
CONTRACT NO. F 33601-67-C-0178	
LEO A. DALY CO. ARCHITECTS ENGINEERS PLANNERS OMAHA - ST. LOUIS - SEATTLE - SAN FRANCISCO - NEW ORLEANS	

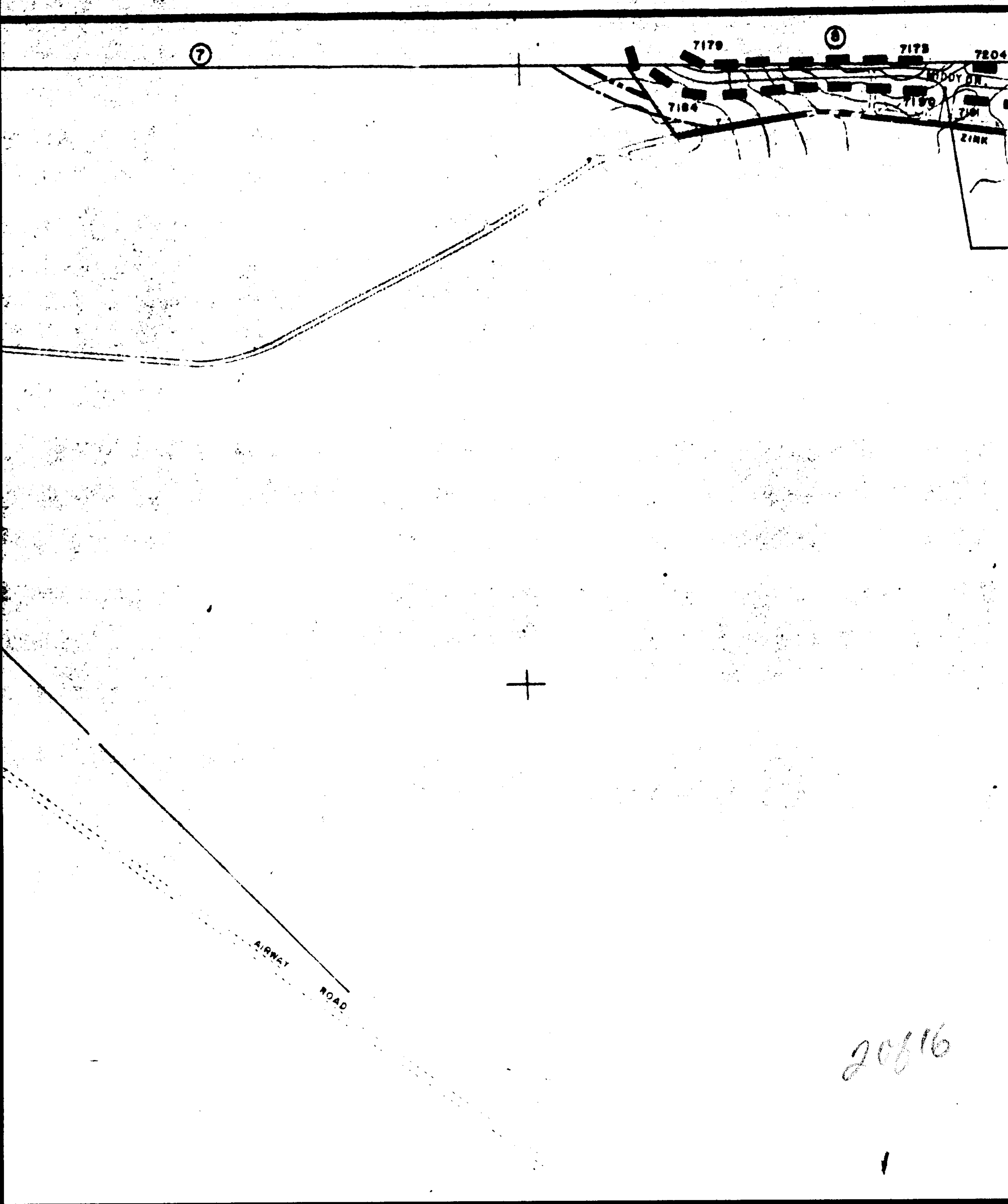
TAB NO G-3

SHEET 4 OF 8

140614


MATCH LINE SHEET 1
621
875
TOWER
NATIONAL RD
ZINK ROAD
NEW GERMANY TREBEIN ROAD

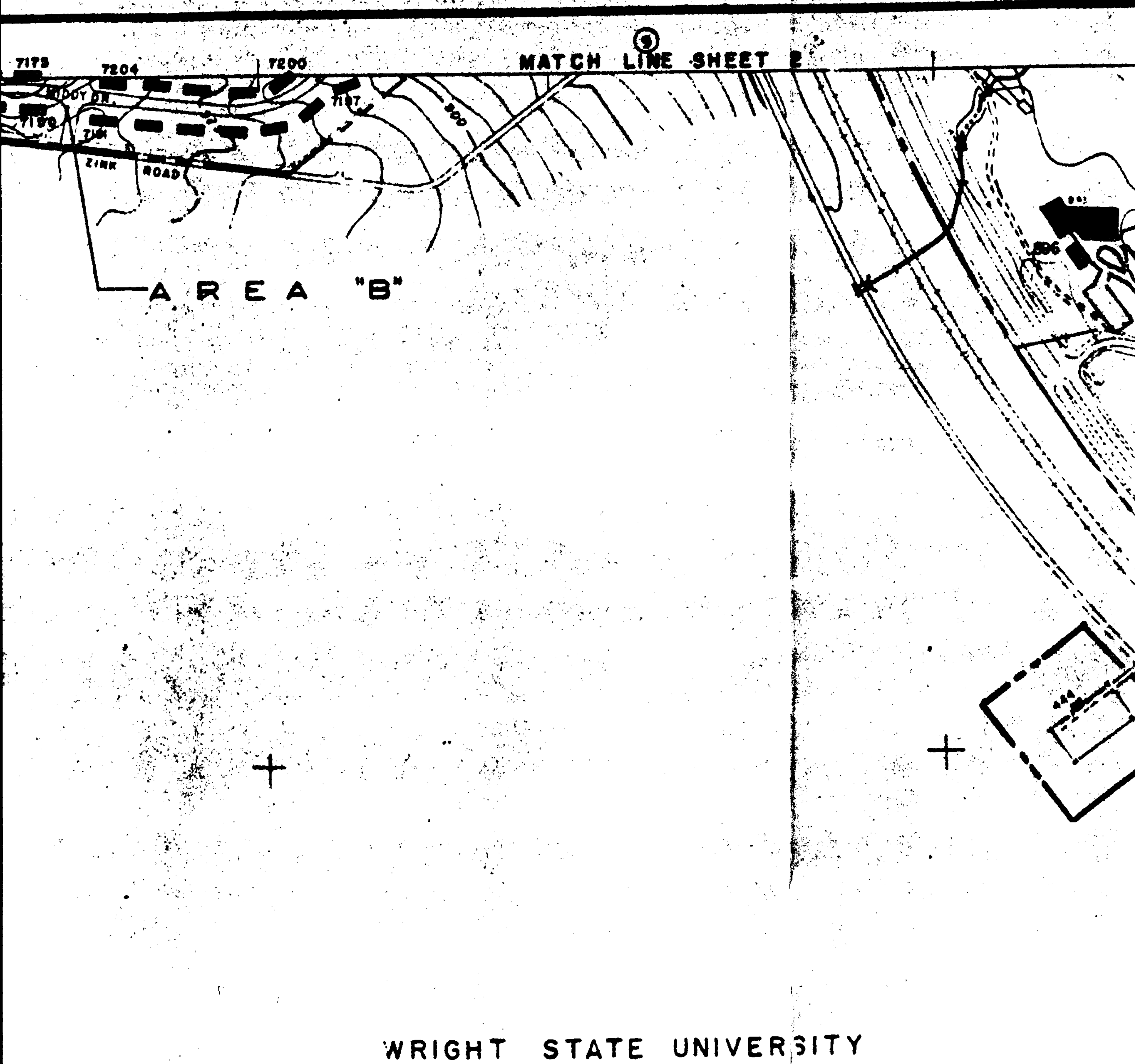
10616



20616

1

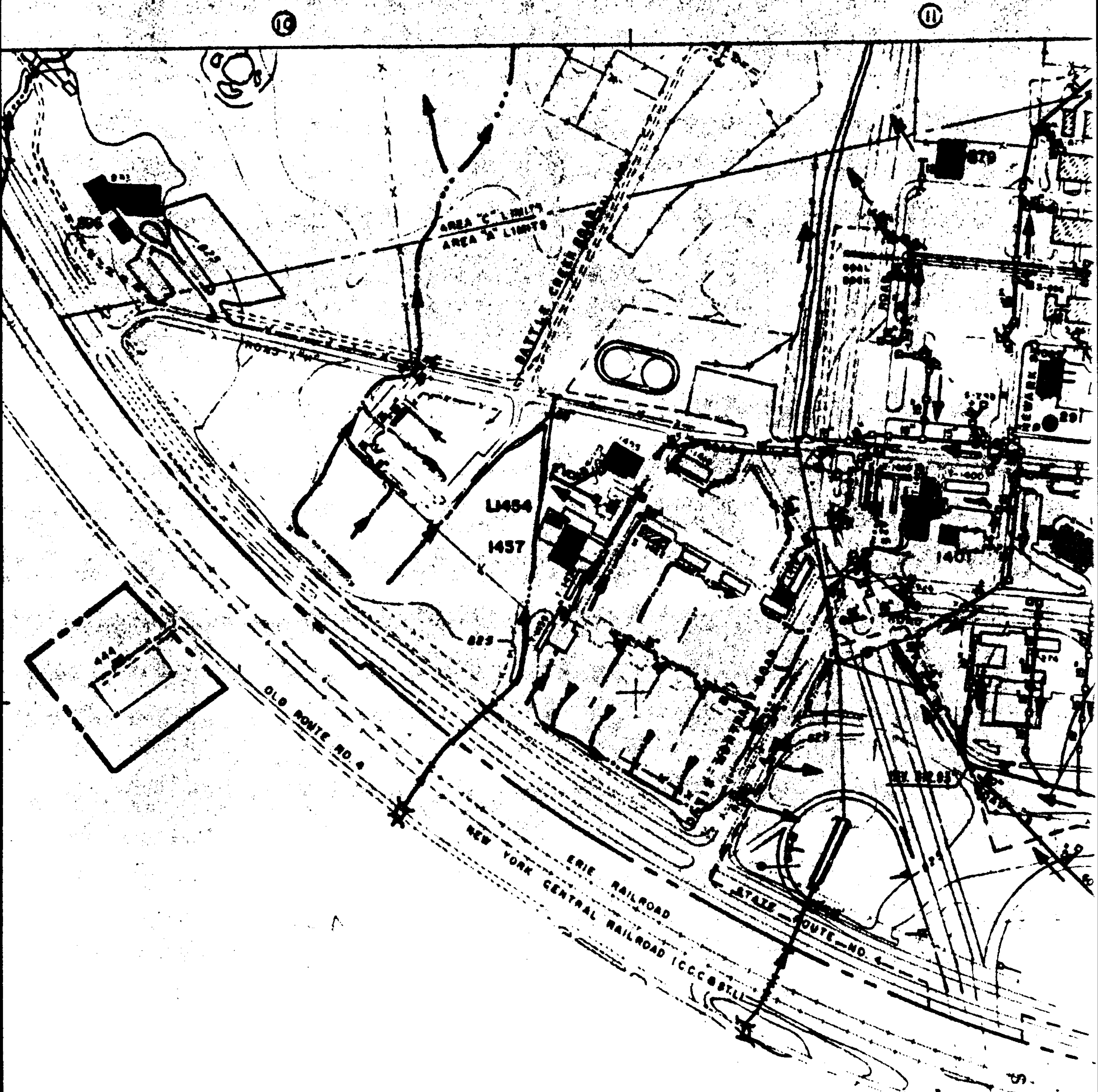
FOR OFFICIAL USE O



3 of 16

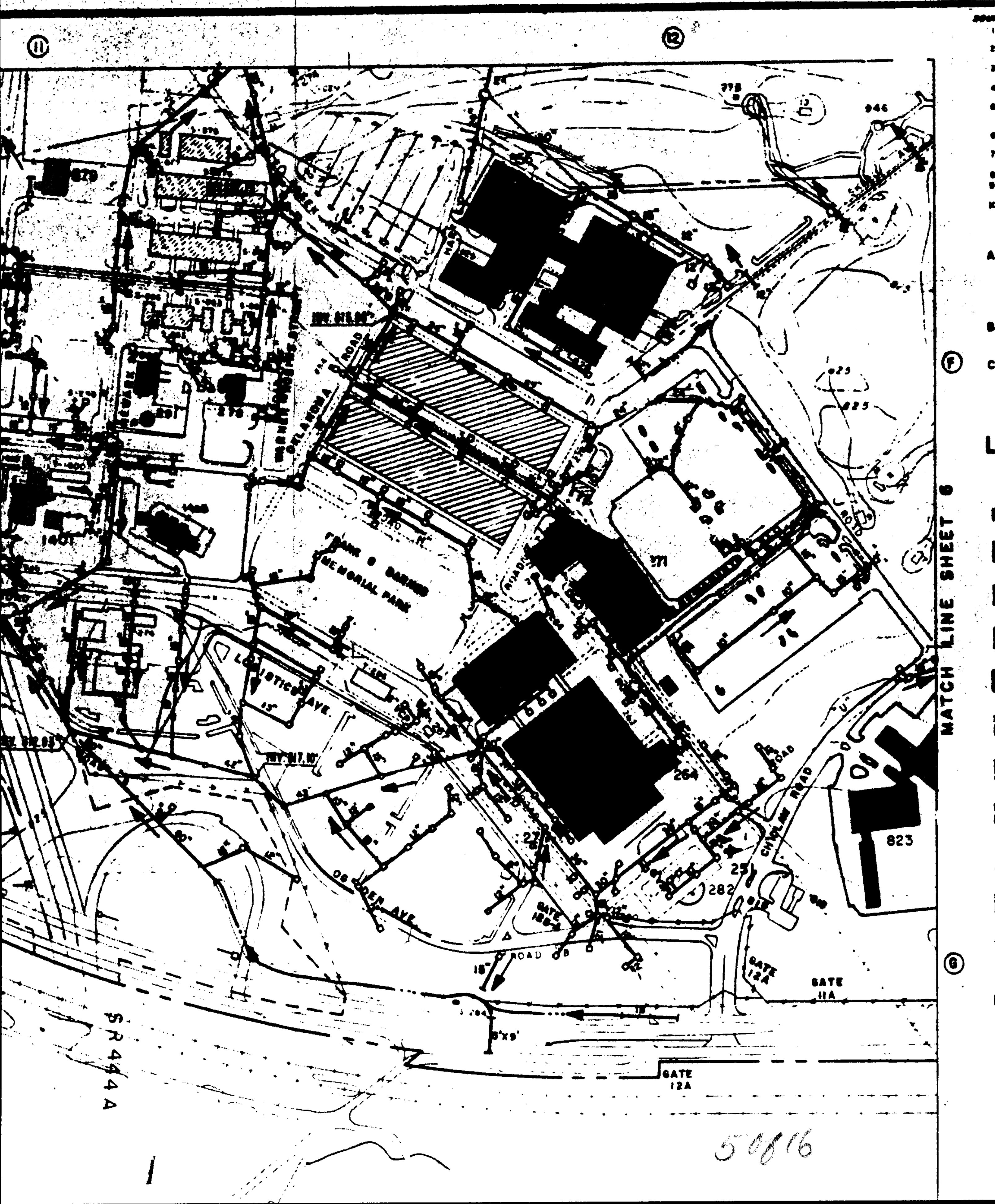
1

CIAL USE ONLY (AFR 11-30)



SR444A

40616



11
12
MATCH LINE SHEET 6
F
G
MEMORIAL PARK
LOGISTICS AVE.
OGDEN AVE.
ROAD
CHIDLAW ROAD
GATE 12A
GATE 11A
GATE 12A
371
264
282
823
946
SR 444 A

5086

SOURCES OF INFORMATION:

1. BUILDING LOCATION PLAN, AREAS A, B & C, AIR INSTALLATIONS WPAFB DWG NO TSU-PF-100, SHEET B, DATED FEB 19, [illegible]
2. BASIC LAYOUT PLAN, AREAS A, B, C & D, AIR INSTALLATIONS, WPAFB DWG. NO EWPE-150, SHEET K, DATED APRIL 1, 1956.
3. U.S. ARMY ENGINEER DISTRICT, LOUISVILLE, SAC DISPERSAL FACILITIES DWG. NO. WPF 142, DATED MAY 1958.
4. U.S. ARMY ENGINEER DISTRICT, LOUISVILLE, NUCLEAR ENGINEERING TEST FACILITIES DWG. NO WPF-88, DATED APRIL 1956.
5. TOPOGRAPHY & BUILDING LOCATION PLAN, AREAS A & C, AIR INSTALLATIONS WPAFB DWG. NO TSU-PF-100, SHEET M, DATED OCT. 2, 1957.
6. BASIC LAYOUT PLAN, AREAS B & D, AIR INSTALLATIONS WPAFB JOB NO. 27-[illegible], SHEET 1 OF 1, DATED OCT. 2, 1957.
7. AERIAL PHOTOGRAPHS, AIR INSTALLATIONS, WPAFB DATED AUG. 1958
8. FIELD CHECK BY GROLL-BEACH & ASSOCIATES, JULY & AUG. 1958.
9. GENERAL UTILITY MAPS - STORM SEWER SYSTEM - AREA "B", WPAFB DWG NO. 27-17049, SHEET 1 THRU 5, DATED JULY 1956, REV.
10. STORM - MASTER PLOT PLAN - AREAS A & C; WPAFB DWG. NO. EWPE 525, SHEETS B,C,F,G,K,L,P, & Q, DATED JULY 1956, REV.

A. BASE MAP AND EXISTING UTILITY LAYOUT ARE FROM GROLL-BEACH AND ASSOCIATES DRAWINGS-WRIGHT PATTERSON AIR FORCE BASE MASTER PLAN DATED 23 DECEMBER, 1959.

B. CONFERENCES WITH DESIGN, MAINTENANCE AND OPERATING PERSONNEL - MARCH - MAY, 1964.

C. SPOT CHECK OF 1" = 20' UTILITY GRID MAPS OF AREA B - MARCH - MAY, 1964.

F

G

L E G E N D

BUILDINGS & STRUCTURES

PERMANENT

SEMI-PERMANENT

TEMPORARY

PROPOSED

UNDERGROUND

OTHER THAN MILITARY

TO BE REMOVED

AIRFIELD PAVEMENT

EXISTING

ABANDONED

ROADS & PARKING

SURFACED

UNIMPROVED

℄ PROPOSED ROADS

GENERAL

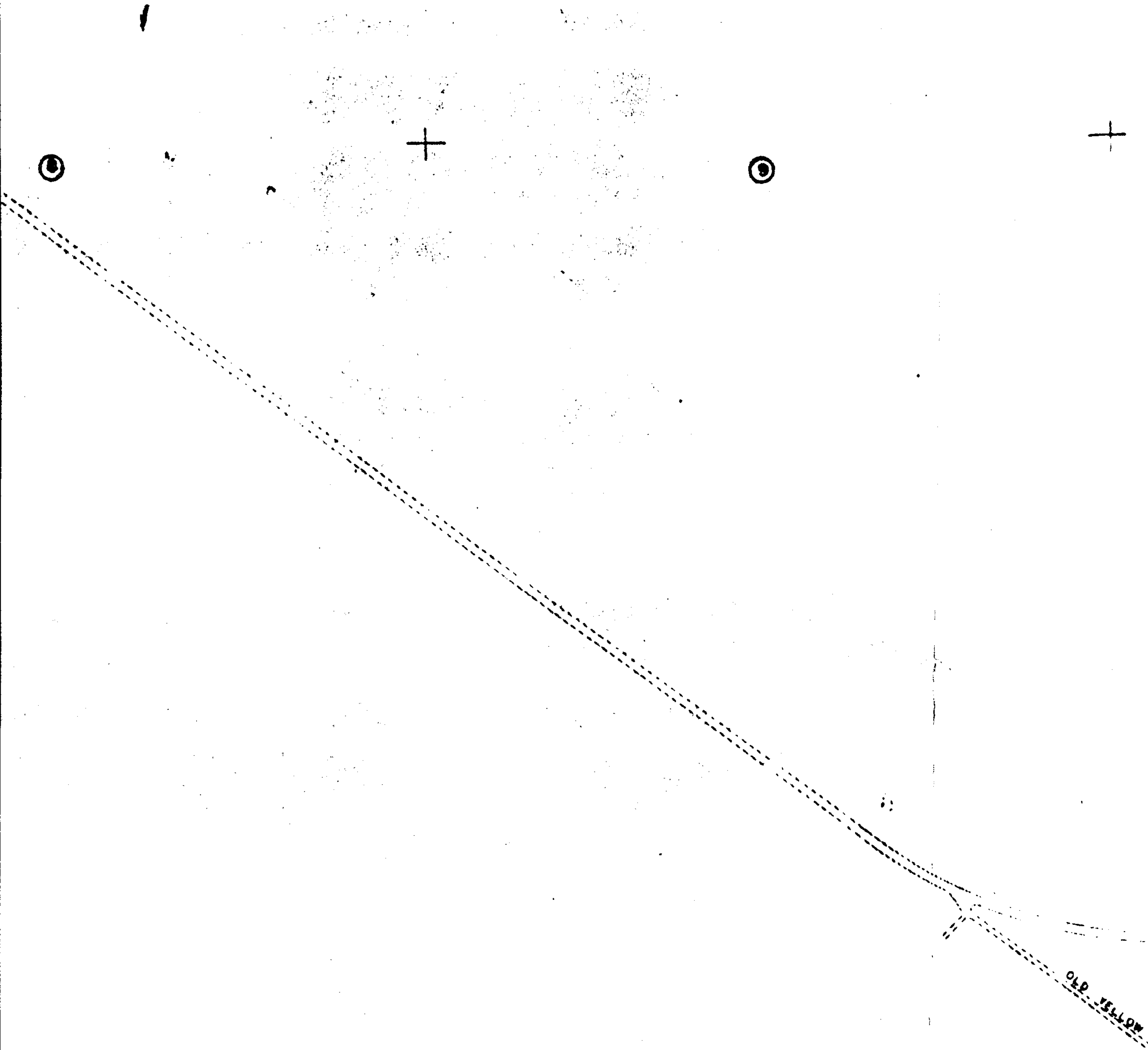
6M6

7086

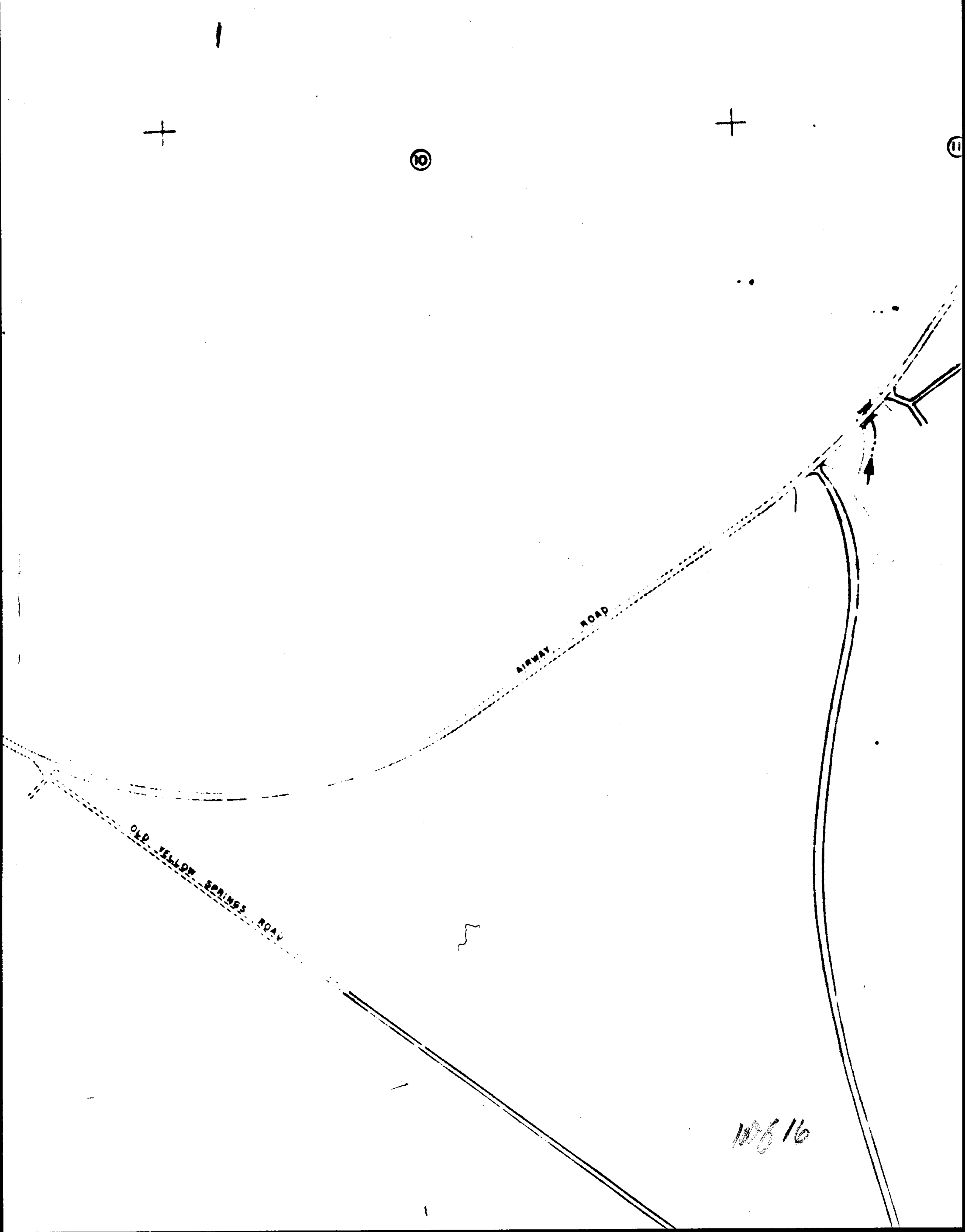
7

8

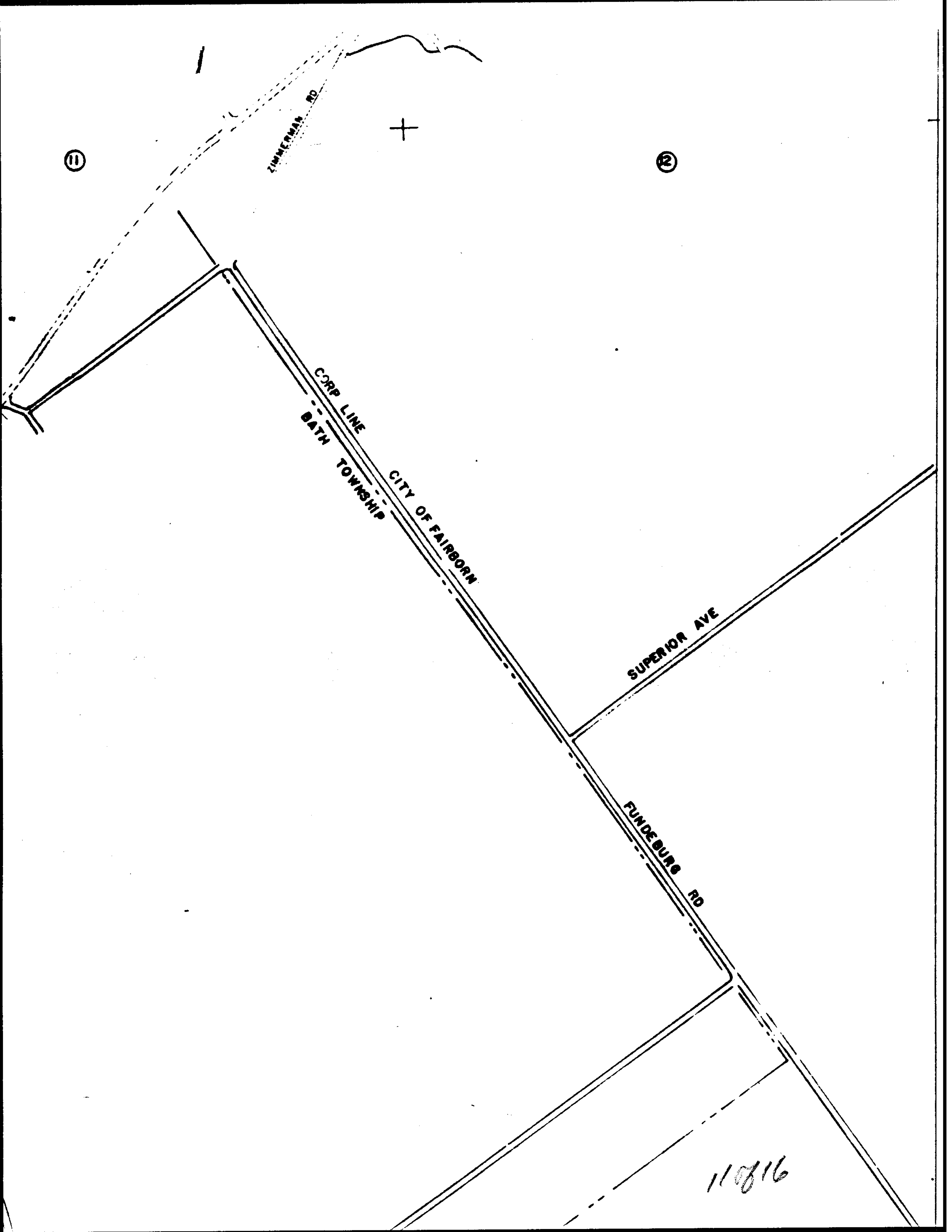
80616



9 of 16

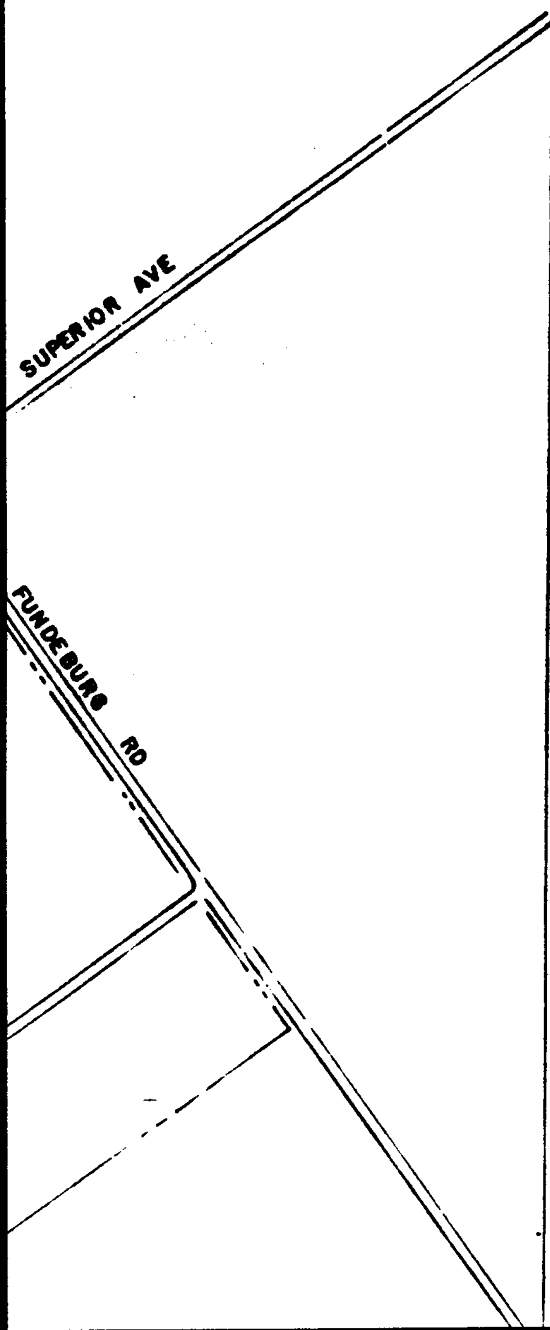


1066/16



1
11
12
ZIMMERMAN RD
CORP LINE
BATH TOWNSHIP
CITY OF FAIRBORN
SUPERIOR AVE
FUNDEBURG RD
11816

⑫



GENERAL

- RESERVATION BOUNDARY
- PROPOSED BOUNDARY
- FENCE
- RAILROAD
- DRAINAGE DITCH
- STREAM OR RIVER
- BERM OR LEVEE
- RETAINING WALL
- EASEMENT

STORM DRAINAGE SYSTEM

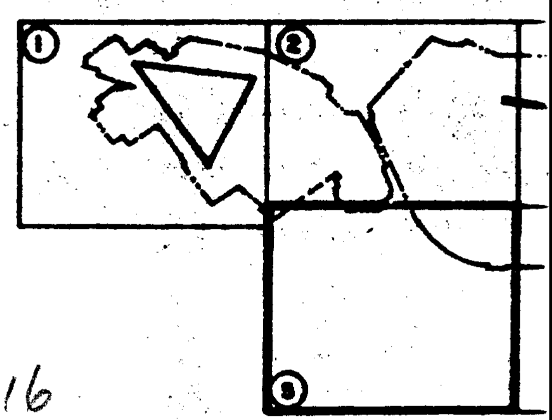
- 15" PIPE WITH SIZE
- MANHOLE
- INV. 796.98' MANHOLE WITH KEY INVERT
- CATCH BASIN OR INLET
- CULVERT
- CONCRETE DRAIN OR PAVED DITCH
- FRENCH DRAIN
- HEADWALLS
- DIRECTION OF FLOW
- EXISTING FACILITY TO BE ABANDONED
- 72" PROPOSED STORM SEWER OR CULVERT (WITH SIZE)

12 of 16

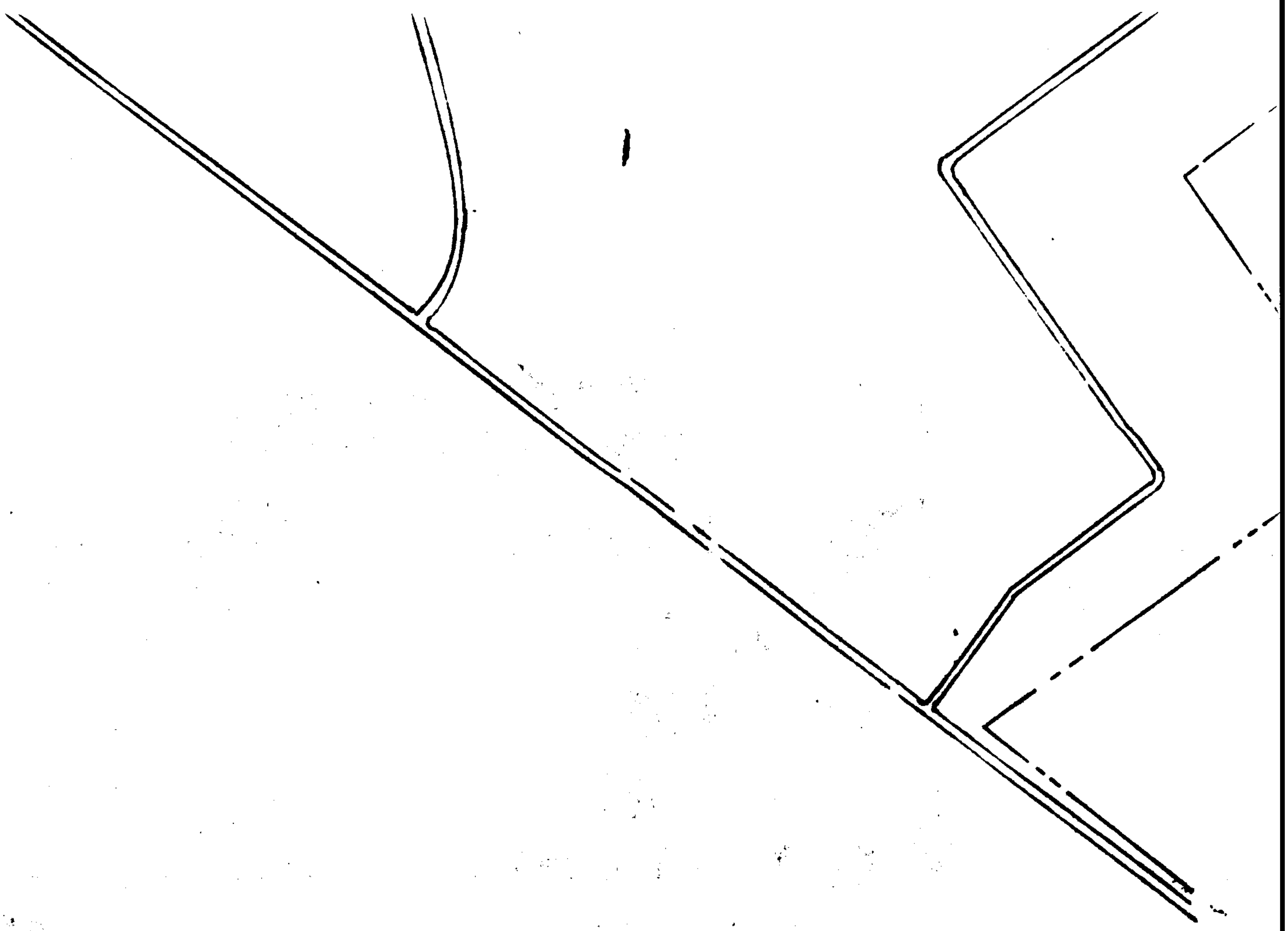
NOTES:

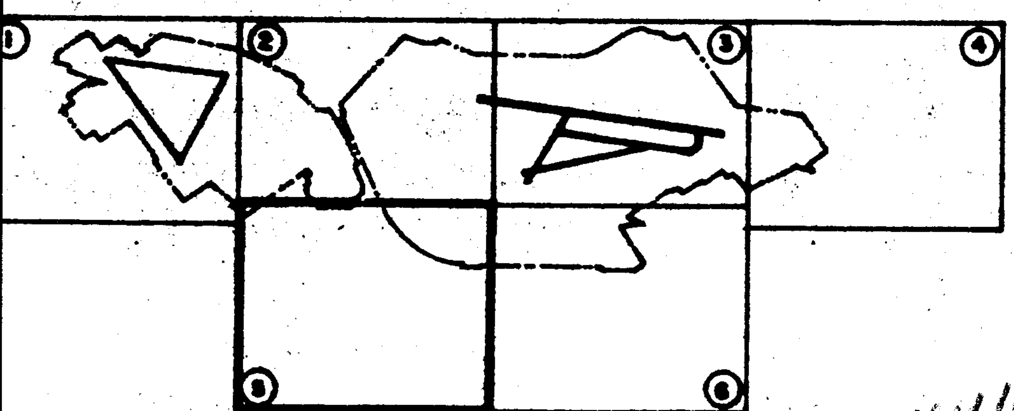
1. ALL PIPE IS CONCRETE UNLESS OTHERWISE NOTED BY: CIP — CAST IRON PIPE
   CMP — CORRUGATED METAL PIPE
   VCP — VITRIFIED CLAY PIPE

130616



KEY





K E Y   M A P

14816

MAG DEC [illegible] 21' W
DATE OF DATA JAN 92
ANNUAL CHANGE
0° 06' 28"

PREVAI

400 0

SCALE IN

AIRFIELD ELEVAT

9	9-30-[illegible]9	ANNUAL REVISION
8	9-[illegible]-85	ANNUAL REVISION
REV	DATE	DESCR

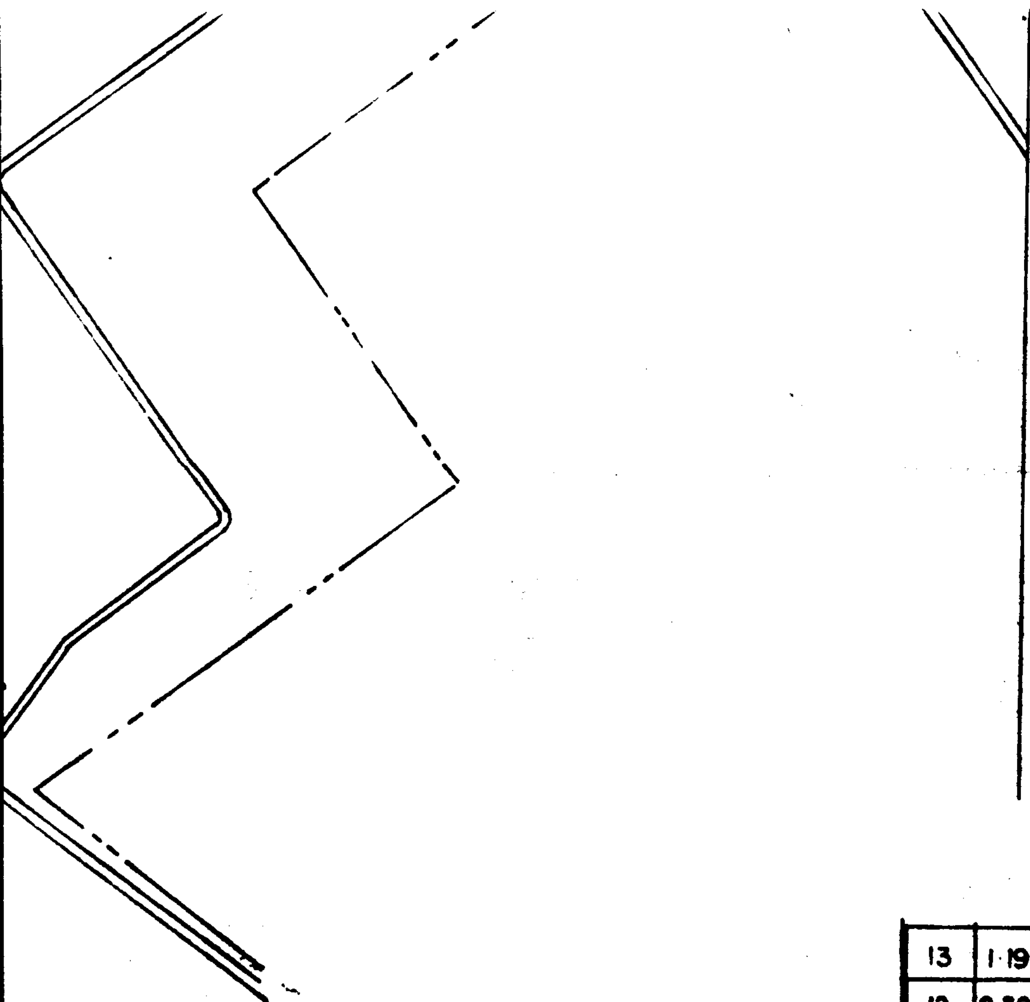
PLAN R

-30)

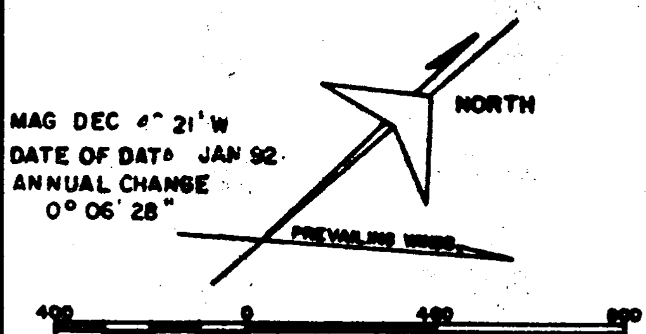
CMP—CORRUGATED METAL PIPE
VCP—VITRIFIED CLAY PIPE

2. PROPOSED FACILITIES, BUILDINGS, BUILDING
CENTERLINE OF ROADS ARE IN ACCORDANCE
SHOWN ON TAB F-1 DATED APRIL, 1965.

3. ALL INFORMATION SHOWN IN AREA "B"
PREPARED AS PART OF THE HARLAND
BARTHOLOMEW MASTER PLAN REVISIO
CONTRACT DATED APRIL, 1965.



13	1-19-94	ANNUAL REVISION UPDATE
12	9-30-92	ANNUAL REVISION UPDATE
11	9-30-91	ANNUAL REVISION UPDATE
10	9-30-90	ANNUAL REVISION UPDATE
6	7-28-86	UPDATE PARKING AREA BLDG. 856
5	2-6-84	YEARLY UPDATE
4	FEB 82	GEN REVISIONS



SCALE IN FEET
AIRFIELD ELEVATION 824 FEET

DATE	DESCRIPTION	INITIAL
9-30-9	ANNUAL REVISION UPDATE	[illegible]
[illegible]-85	ANNUAL REVISION UPDATE	JRN

PLAN REVISIONS

DEPARTMENT OF THE AIR FO
DIRECTORATE OF CIVIL ENGINEERING [illegible] - WASHIN

HEADQUARTERS AIR FORCE LOGISTICS CO

MASTER PLAN
STORM DRAINAGE SYST
WRIGHT-PATTERSON AIR FOR
FAIRBORN, OHIO

SCALE: 1 INCH = 400 FT	DATE: 1 MAY 1969
CONTRACT NO.	F 33601-67-C-0170

TAB NO. C

LEO A. DALY CO. ARCHITECTS ENGINEERS PLANNERS
OMAHA - ST LOUIS - SEATTLE - SAN FRANCISCO - NEW ORLEANS

SHEET

15M16

CMP—CORRUGATED METAL PIPE
VCP—VITRIFIED CLAY PIPE

2. PROPOSED FACILITIES, BUILDINGS, BUILDING NUMBERS AND CENTERLINE OF ROADS ARE IN ACCORDANCE PROPOSALS SHOWN ON TAB F-1 DATED APRIL, 1965.

3. ALL INFORMATION SHOWN IN AREA "B" WAS PREPARED AS PART OF THE HARLAND BARTHOLOMEW MASTER PLAN REVISION CONTRACT DATED APRIL, 1965.

13	1-19-94	ANNUAL REVISION UPDATE	VRM
12	9-30-92	ANNUAL REVISION UPDATE	JRH
11	9-30-91	ANNUAL REVISION UPDATE	EGO
10	9-30-90	ANNUAL REVISION UPDATE	JRH
6	7-28-86	UPDATE PARKING AREA BLDG. 856	SK
5	2-6-84	YEARLY UPDATE	RDN
4	FEB 82	GEN REVISIONS	[illegible]

DEPARTMENT OF THE AIR FORCE

DIRECTORATE OF CIVIL ENGINEERING DCS/P&R – WASHINGTON, D.C.

HEADQUARTERS AIR FORCE LOGISTICS COMMAND

MASTER PLAN

STORM DRAINAGE SYSTEM

WRIGHT-PATTERSON AIR FORCE BASE

FAIRBORN, OHIO

SCALE: 1 INCH = 400 FT. DATE: 1 MAY 1969

CONTRACT NO. F 33601-67-C-0170

LEO A. DALY CO. ARCHITECTS ENGINEERS PLANNERS
OMAHA - ST. LOUIS - SEATTLE - SAN FRANCISCO - NEW ORLEANS

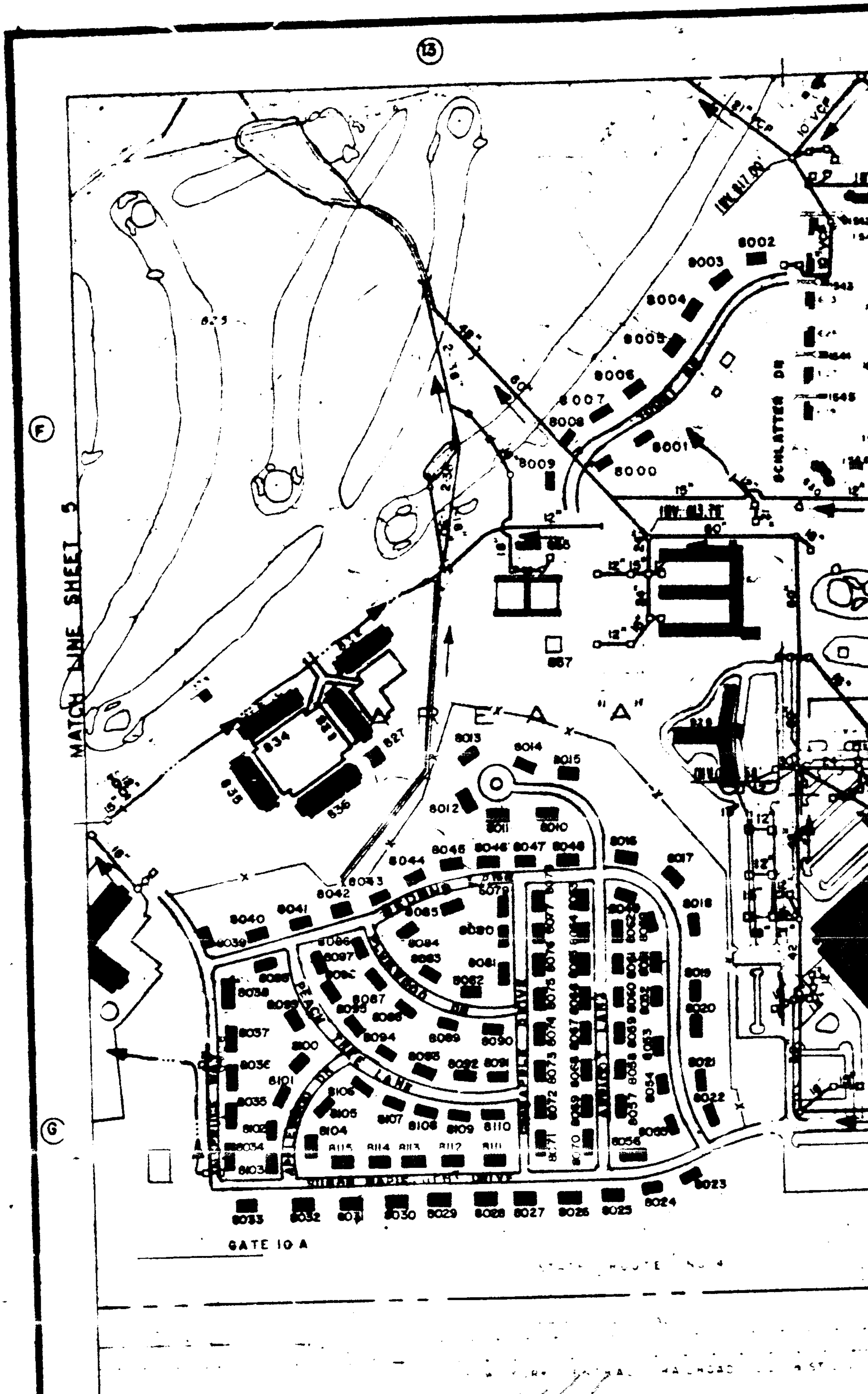
TAB NO G-3

SHEET 5 OF 6

ET

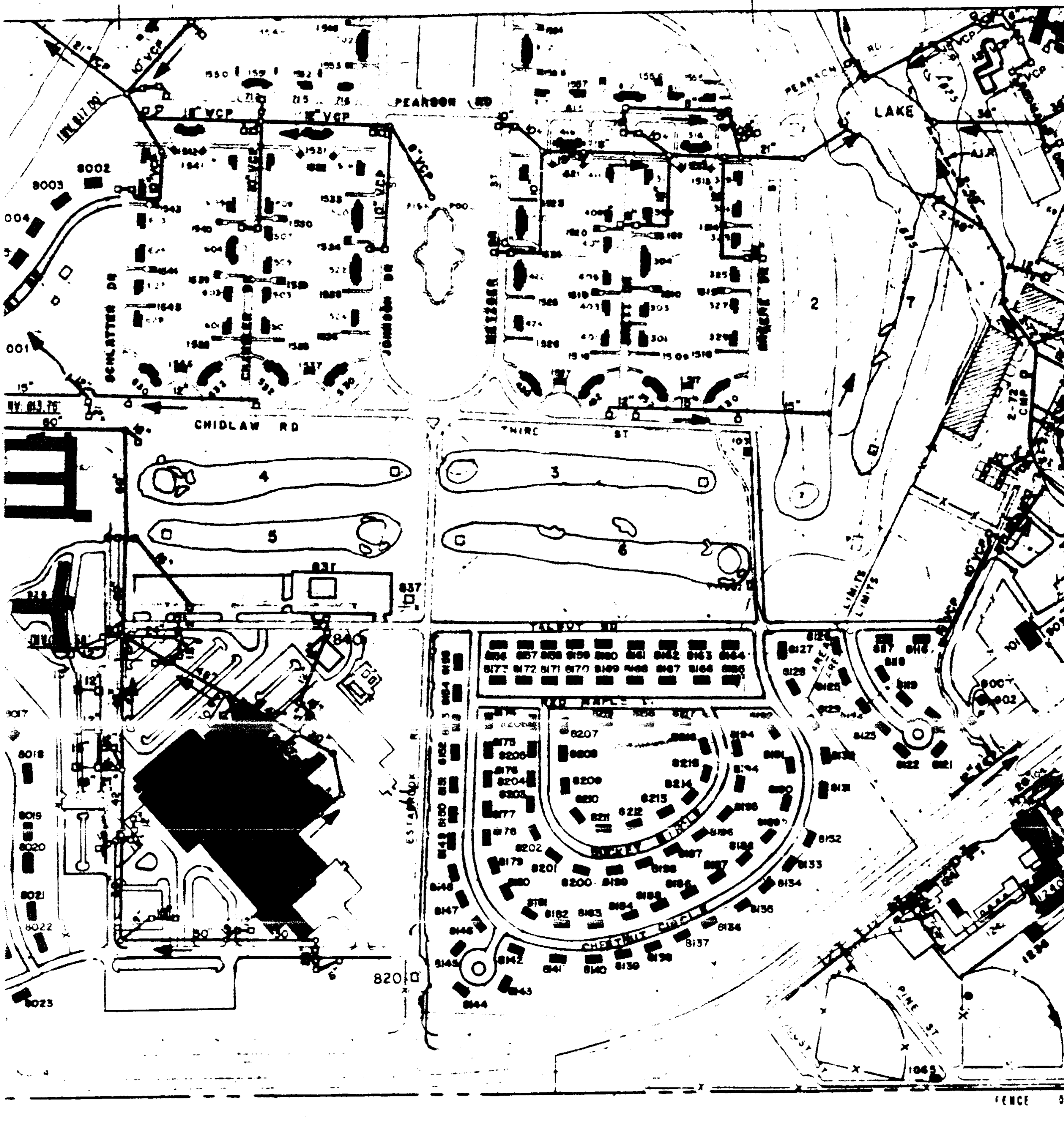
	JRP
	JRN
	INITIAL

16 of 16

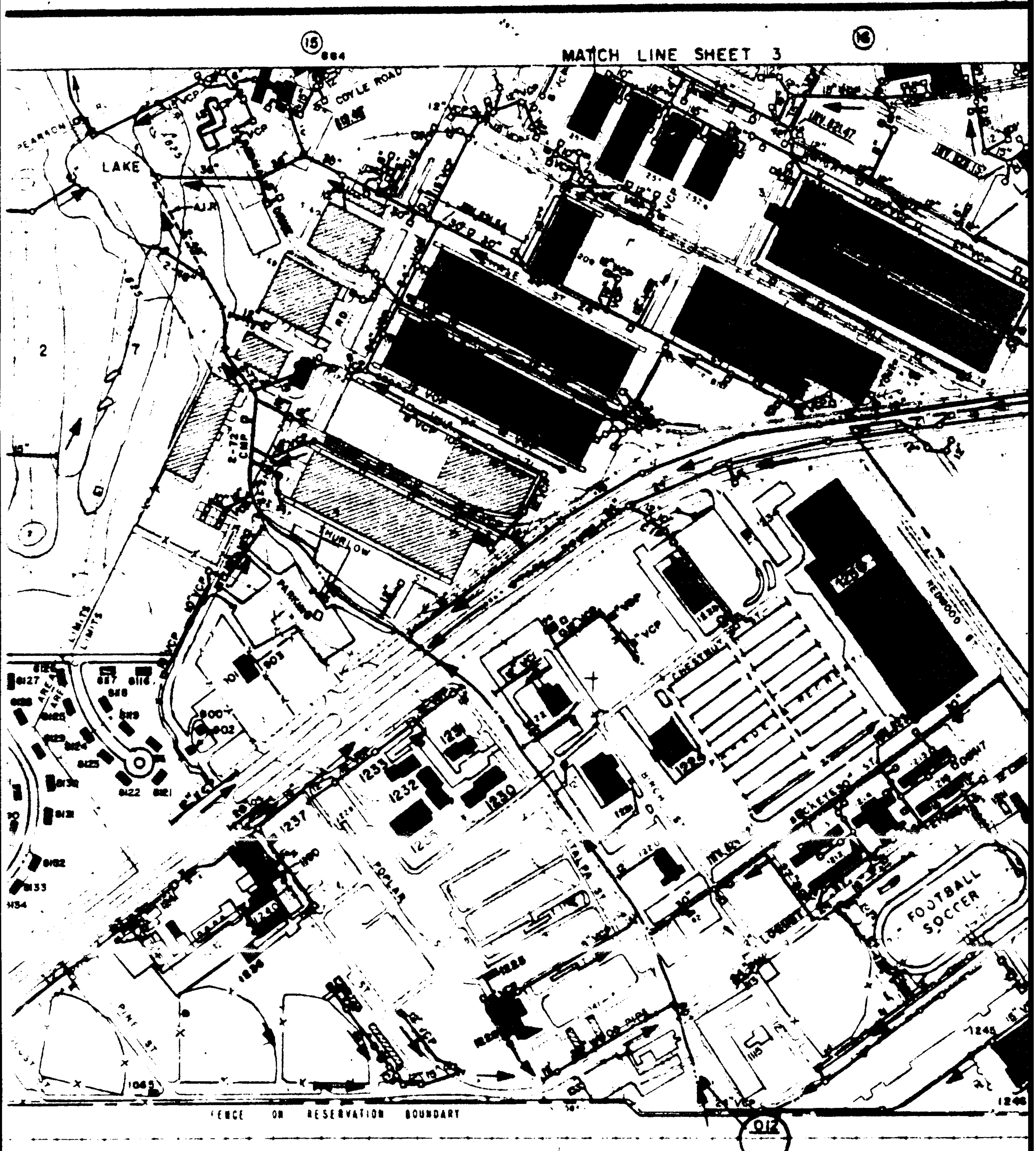

13
MATCH LINE SHEET 5
AREA "A"
GATE 10 A
SCHLATTER DR
PEACH TREE LANE
8000
8001
8002
8003
8004
8005
8006
8007
8008
8009
834
835
836
837
867
8023
8024
8025
8026
8027
8028
8029
8030
8031
8032
8033

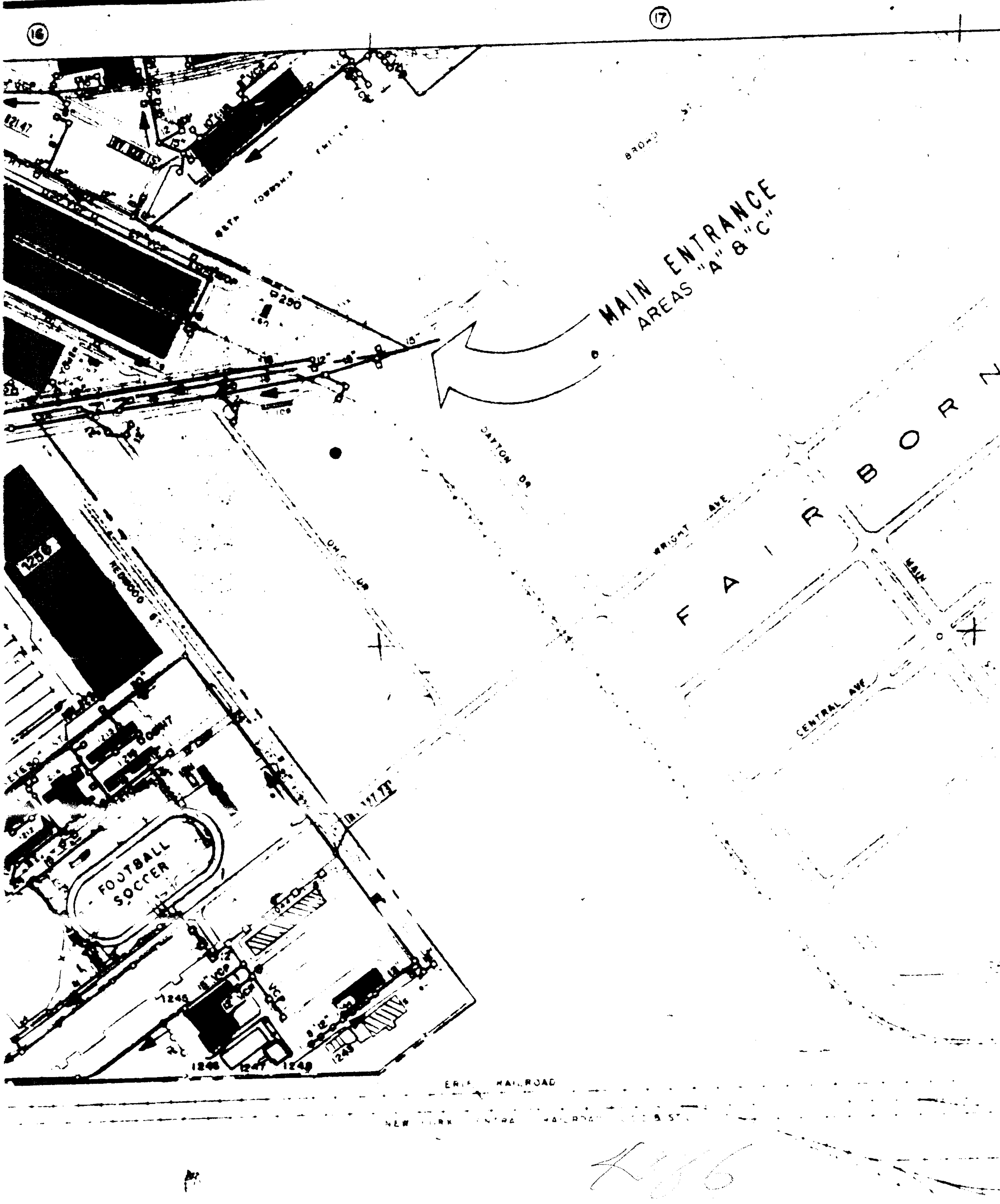
1966

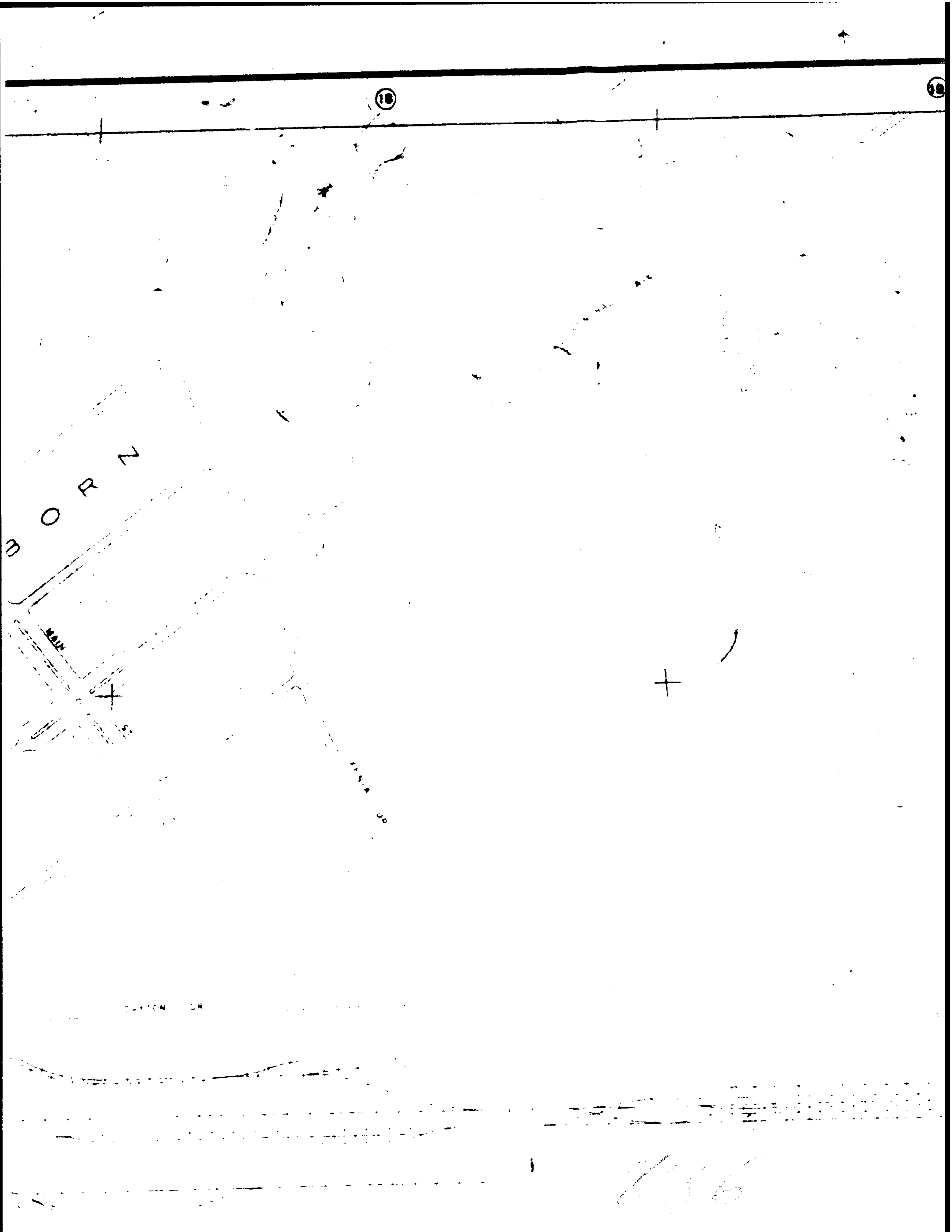
14



PEARSON RD
LAKE
CHIDLAW RD
THIRD ST
SCHLATTER DR
ESTABROOK
CHESTNUT CIRCLE
LIMITS
PINE ST
8002
8003
8018
8019
8020
8021
8022
8023
820
837
840
1065
FENCE


MATCH LINE SHEET 3
LAKE
PEARSON
COYLE ROAD
MURLOW
CHESTNUT
REDWOOD
POPLAR
FOOTBALL
SOCCER
PINE ST
LIMITS
1233
1232
1230
1231
1237
FENCE ON RESERVATION BOUNDARY
012


16
17
MAIN ENTRANCE
AREAS "A" & "C"
FAIRBORN
WRIGHT AVE.
CENTRAL AVE
MAIN
DAYTON DR
FOOTBALL
SOCCER
ERIE RAILROAD
1246
1247
1248
1249
1250


18
MAIN

19

F

L E G E N D

BUILDINGS & STRUCTURES

PERMANENT

SEMI-PERMANENT

TEMPORARY

PROPOSED

UNDERGROUND

OTHER THAN MILITARY

TO BE REMOVED

AIRFIELD PAVEMENT

EXISTING

G ABANDONED

ROADS & PARKING

SURFACED

UNIMPROVED

℄ PROPOSED ROADS

GENERAL

6086

13

1046

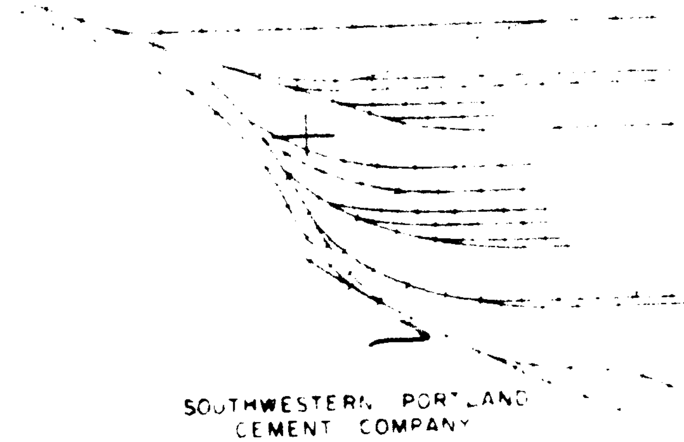
14

15

296

3066

17



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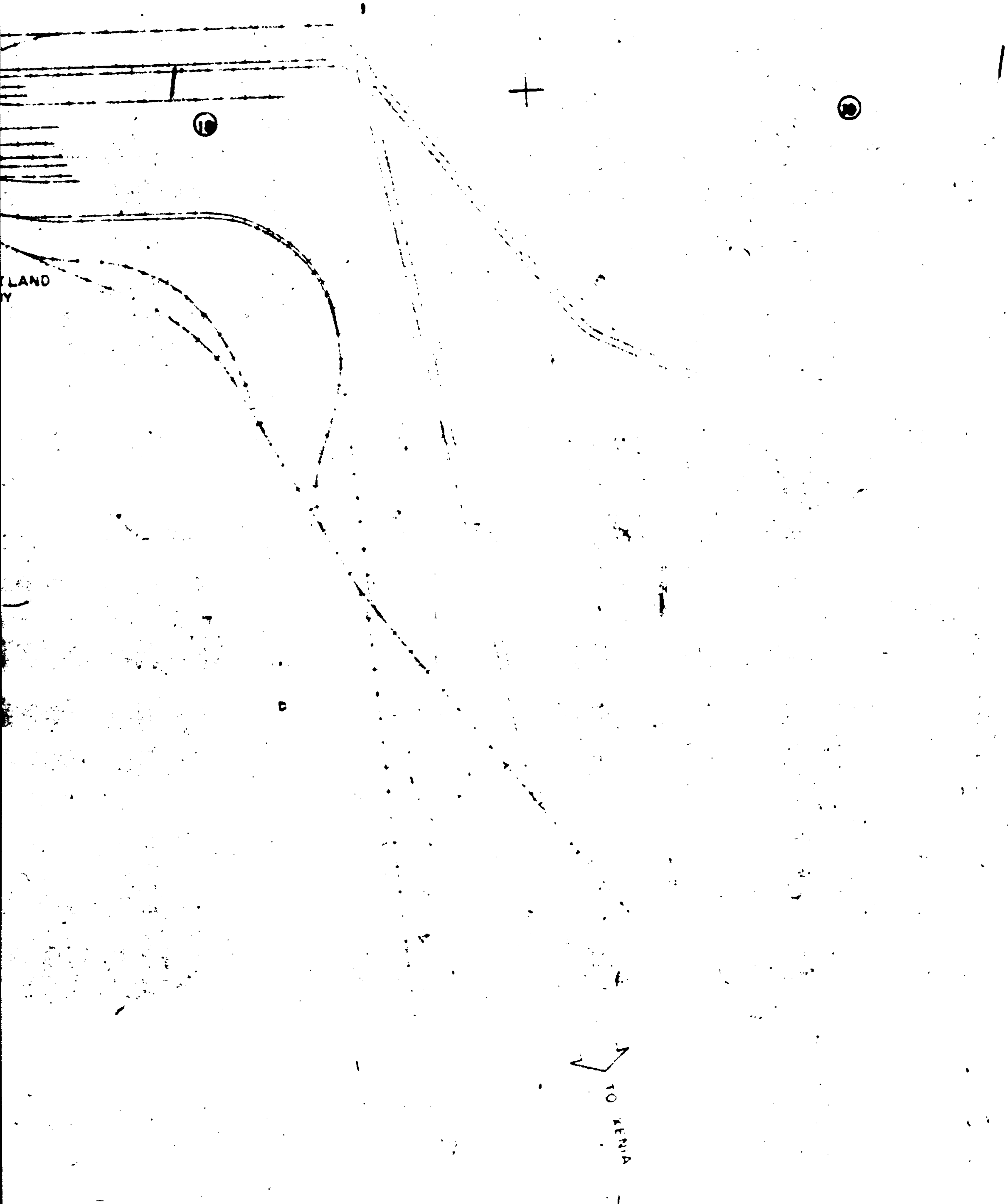


5 of 6

GENERAL

RESERVATION BOUNDARY

PROPOSED BOUNDARY

FENCE

RAILROAD

DRAINAGE DITCH

STREAM OR RIVER

BERM OR LEVEE

RETAINING WALL

EASEMENT

STORM DRAINAGE SYSTEM

15" PIPE WITH SIZE

MANHOLE

INV 796.90' MANHOLE WITH KEY INVERT

CATCH BASIN OR INLET

CULVERT

CONCRETE DRAIN OR PAVED DITCH

FRENCH DRAIN

HEADWALLS

DIRECTION OF FLOW

EXISTING FACILITY TO BE ABANDONED

72" PROPOSED STORM SEWER OR CULVERT (WITH SIZE)

ABANDONED IN PLACE (A.I.P.)

NOTES:

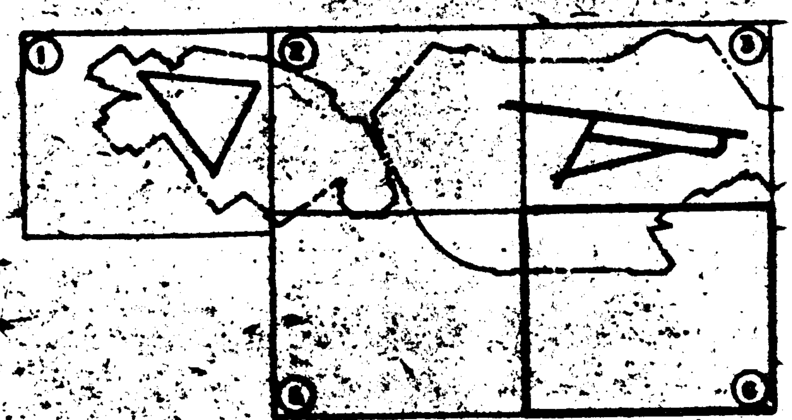
1. ALL PIPE IS CONCRETE UNLESS OTHERWISE NOTED BY: CIP — CAST IRON PIPE
   CMP — CORRUGATED METAL PIPE
   VCP — VITRIFIED CLAY PIPE

2. NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM SAMPLING POINTS (NPDES)

6 of 6

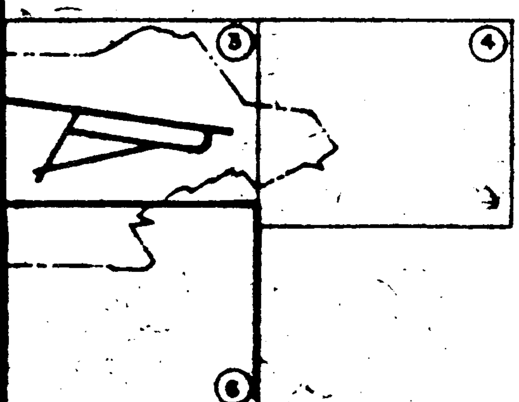
FOR OFFICI

245



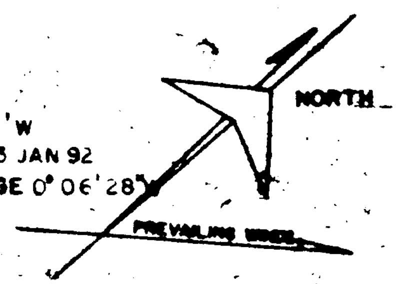
KEY MAP

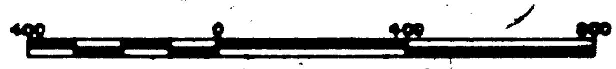
3045



M A P

MAG DEC 4° 21' W
DATE OF DATA 3 JAN 92
ANNUAL CHANGE 0° 06' 28" W





SCALE IN FEET

AIRFIELD ELEVATION 824 FEET

REV	DATE	DESCRIPTION	INITIAL
3	AUG 80	UPDATE	DWS
2	2/2/79	GEN UPDATE	DRS

PLAN REVISIONS

4065

1. ALL PIPE IS CONCRETE UNLESS OTHERWISE NOTED BY: CIP — CAST IRON PIPE
CMP — CORRUGATED METAL PIPE
VCP — VITRIFIED CLAY PIPE

2. NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM SAMPLING POINTS (NPDES)

DISCHARGE S/N	SITE LOCATION		LOCAL
	39° 48' 42"	84° 01' 11"	#012
	39° 47' 58"	84° 02' 24"	-J

12	1-19-94	ANNUAL REVISION UPDATE	VRM
11	9-30-92	ANNUAL REVISION UPDATE	JRH
10	9-30-91	ANNUAL REVISION UPDATE	LRB
9	9-30-90	ANNUAL REVISION UPDATE	JRH
8	9-30-89	ANNUAL REVISION UPDATE	JRH
7	9-30-88	ANNUAL REVISION UPDATE	JRH
6	9-30-87	ANNUAL REVISION UPDATE	JRH
5	1-23-84	YEARLY UPDATE	RDH
4	MAR 82	GEN REVISIONS	E. S.

NORTH

24 FEET

	DWS
	DRS
	INITIAL

DEPARTMENT OF THE AIR FORCE

DIRECTORATE OF CIVIL ENGINEERING DCS/P&R – WASHINGTON, D.C.

HEADQUARTERS AIR FORCE LOGISTICS COMMAND

MASTER PLAN

STORM DRAINAGE SYSTEM

WRIGHT-PATTERSON AIR FORCE BASE

FAIRBORN, OHIO

SCALE: 1 INCH = 400 FT | DATE: 1 MAY 1969

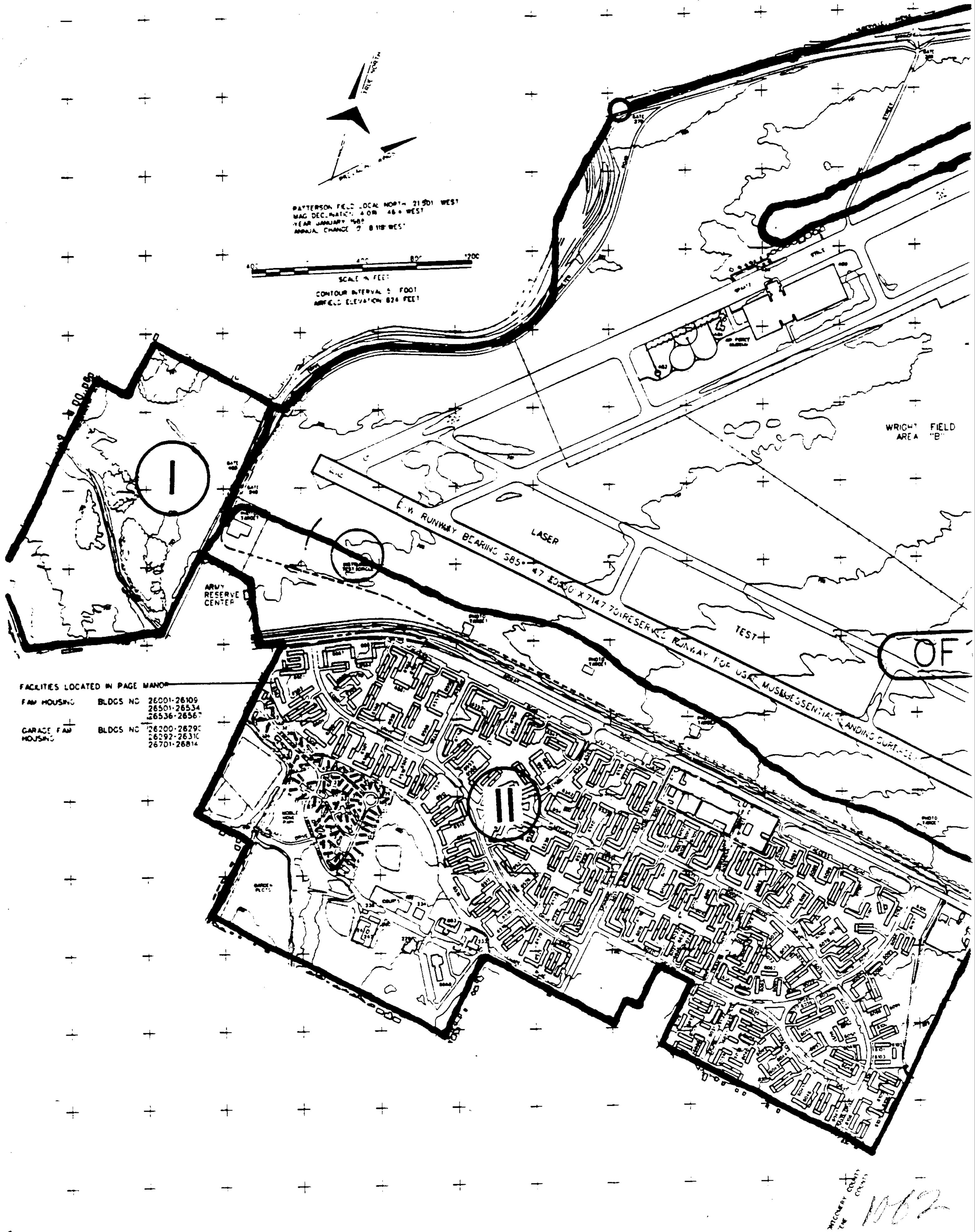
CONTRACT NO. F 33601-67-C-0170

TAB NO G

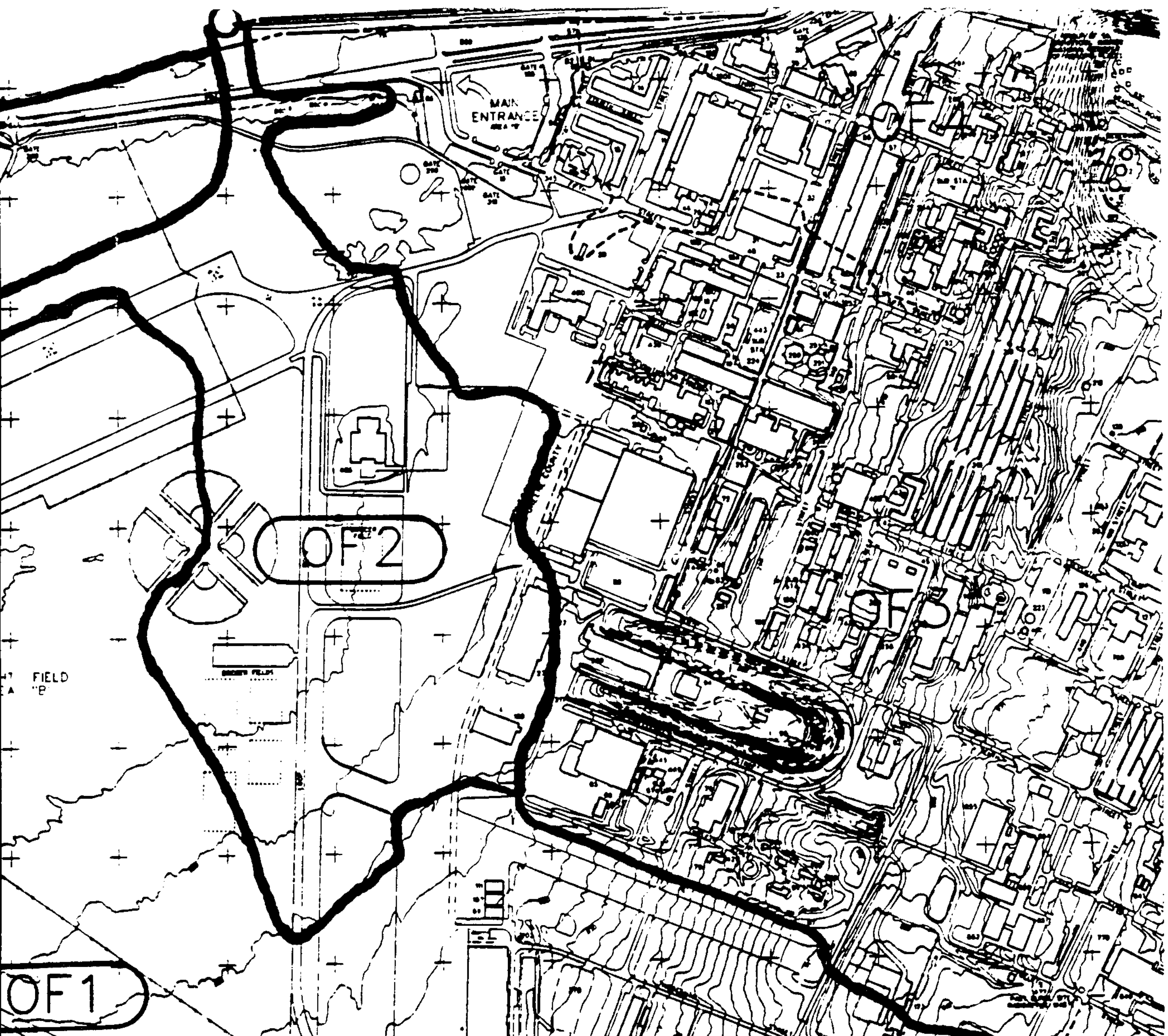
LEO A. DALY CO. ARCHITECTS ENGINEERS PLANNERS
OMAHA - ST LOUIS - SEATTLE - SAN FRANCISCO - NEW ORLEANS

SHEET 6 OF

5085

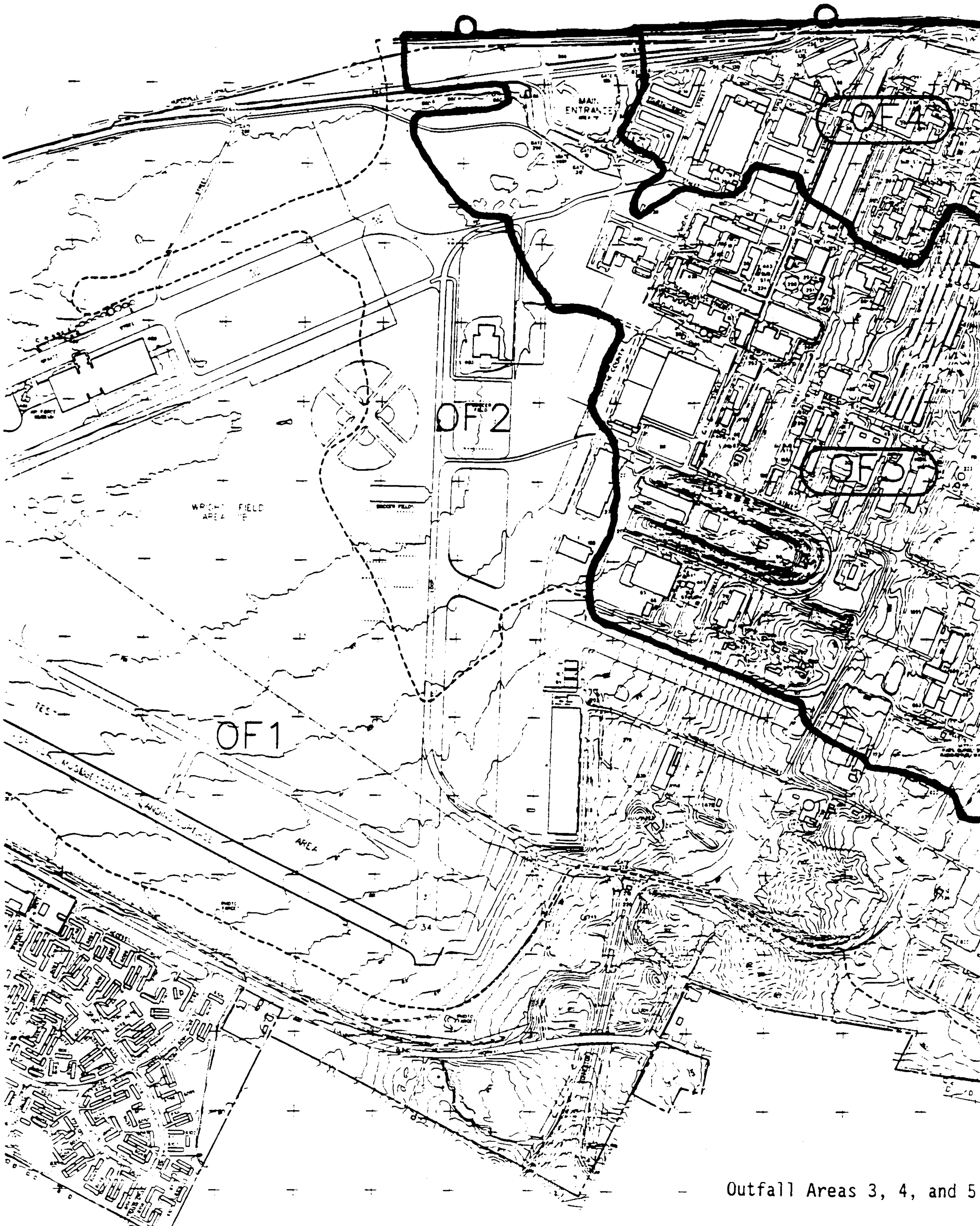


PATTERSON FIELD LOCAL NORTH 21 501 WEST
MAG DECLINATION 4 08 46 WEST
SCALE IN FEET
CONTOUR INTERVAL 5 FOOT
400
800
1200
I
II
ARMY RESERVE CENTER
LASER
TEST
E-W RUNWAY BEARING S85° 47 E
RESERVE RUNWAY FOR USE
LANDING SURFACE
WRIGHT FIELD AREA "B"
OF
FACILITIES LOCATED IN PAGE MANOR
FAM HOUSING BLDGS NO 26001-26109
26501-26534
26536-26567
GARAGE FAM HOUSING BLDGS NO 26200-26290
26292-26310
26701-26814

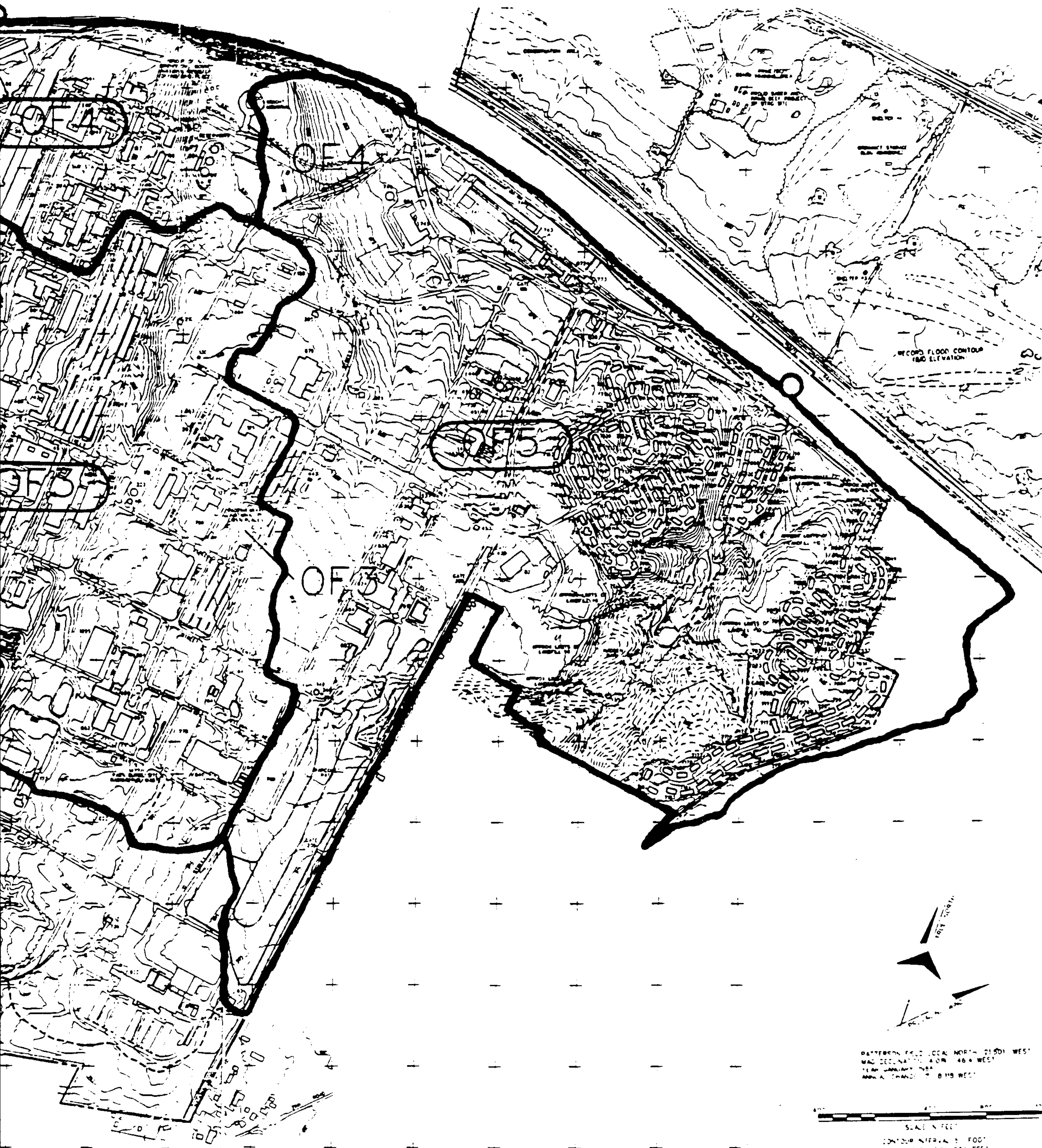


Outfall Areas 1 and 2, Drainage Areas I, II, and III.

202

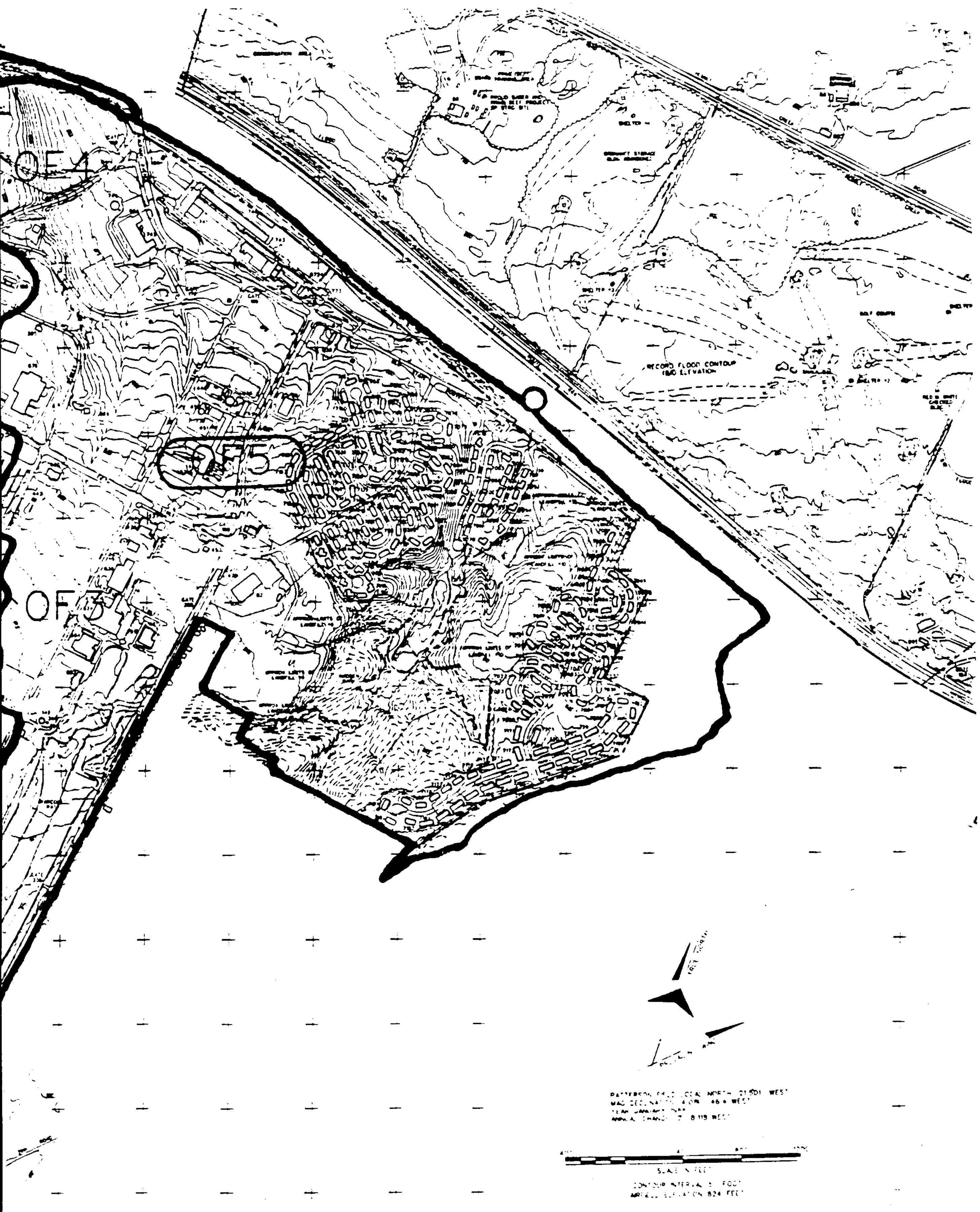


Outfall Areas 3, 4, and 5.



as 3, 4, and 5.

2013



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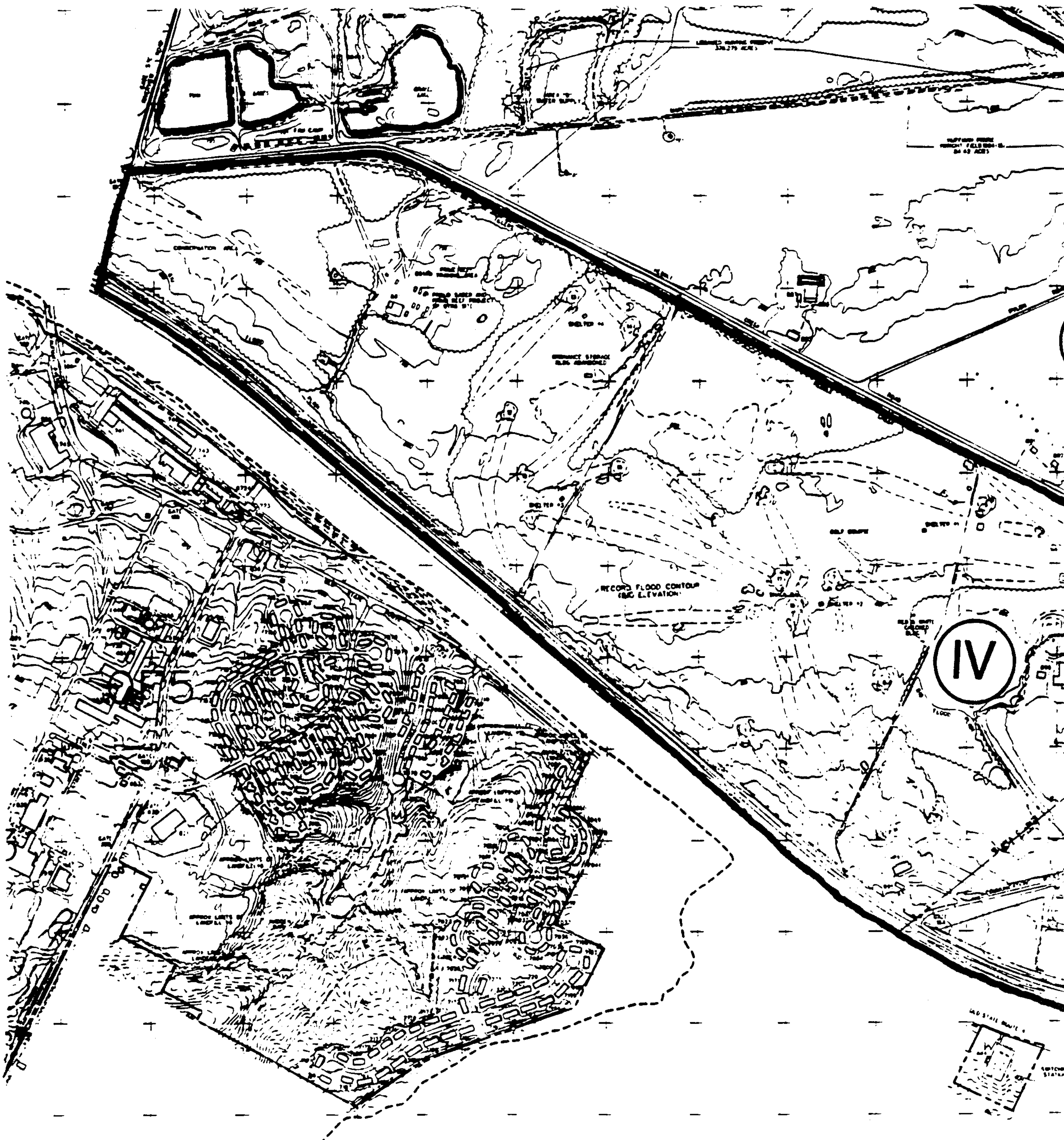
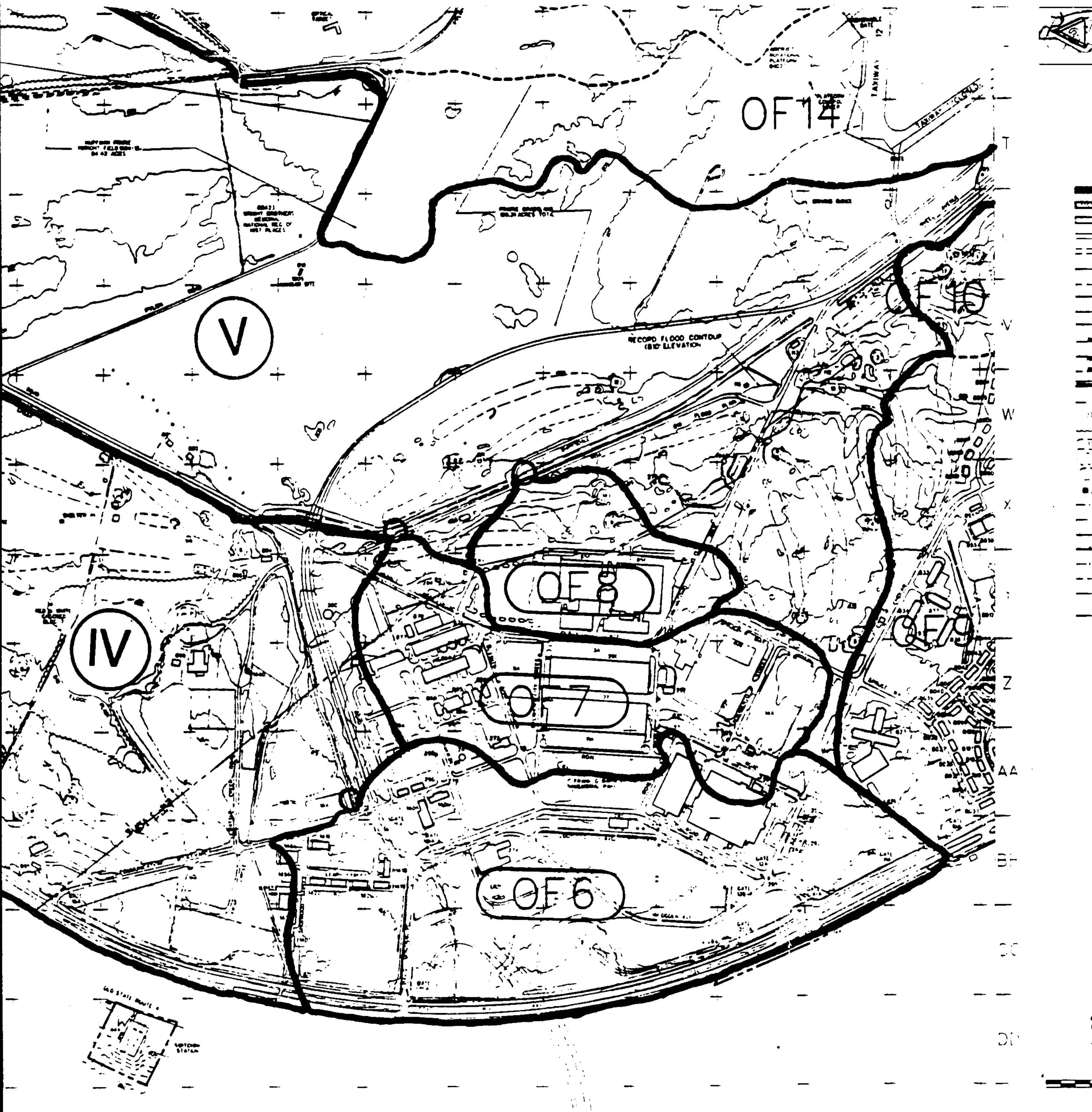
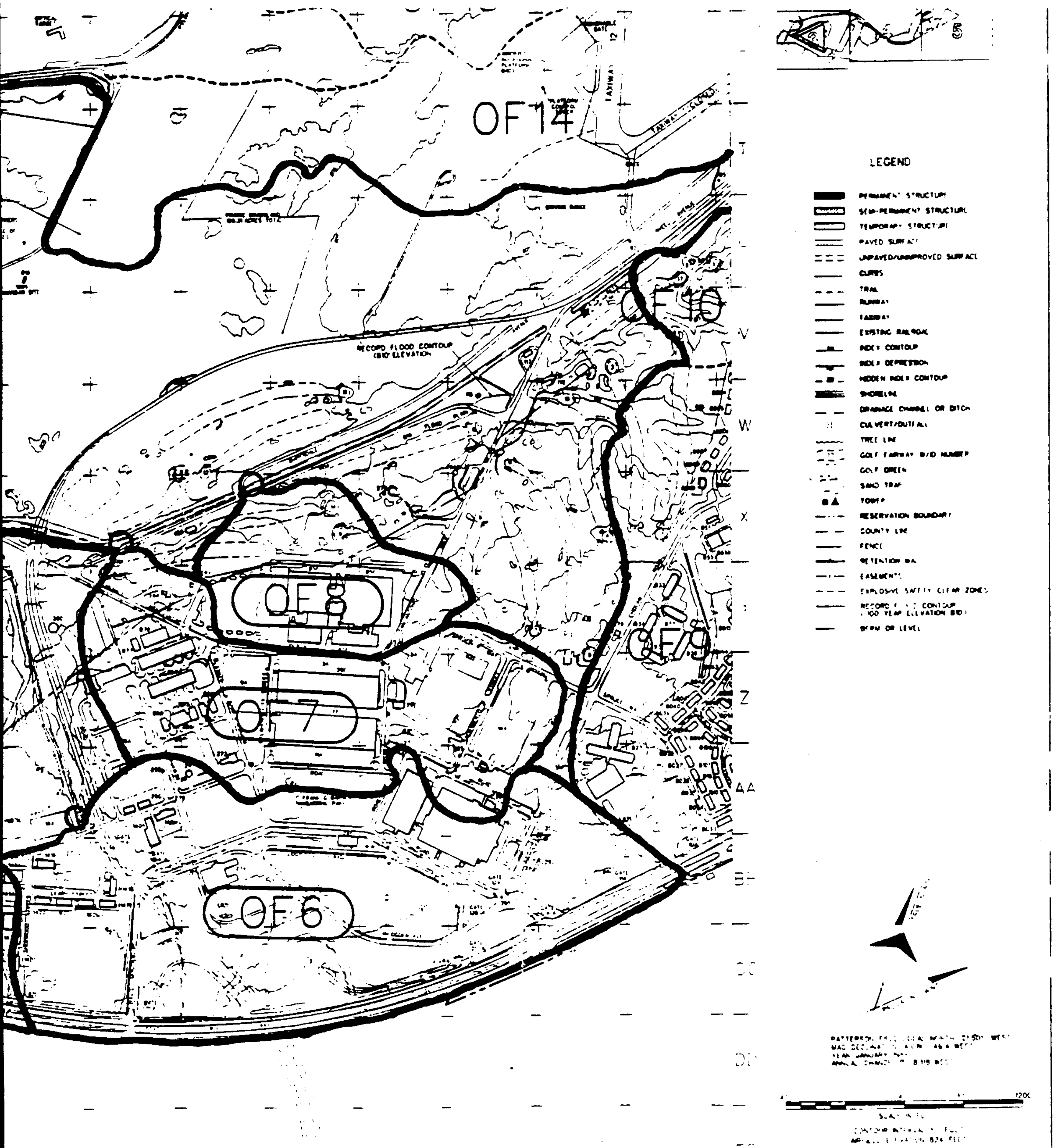


Outfall Areas 6, 7, and 8, D

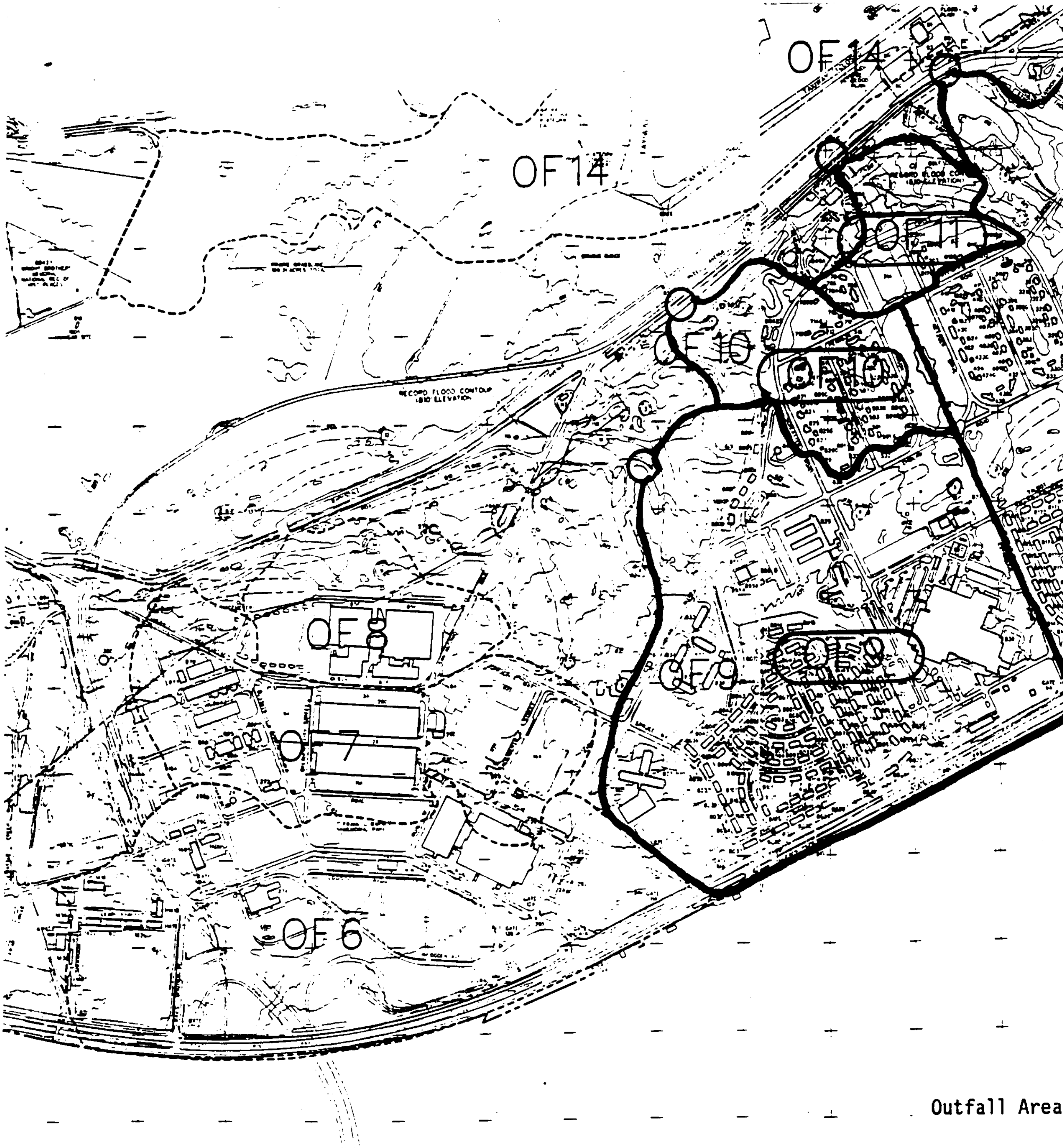


eas 6, 7, and 8, Drainage Areas IV and V.



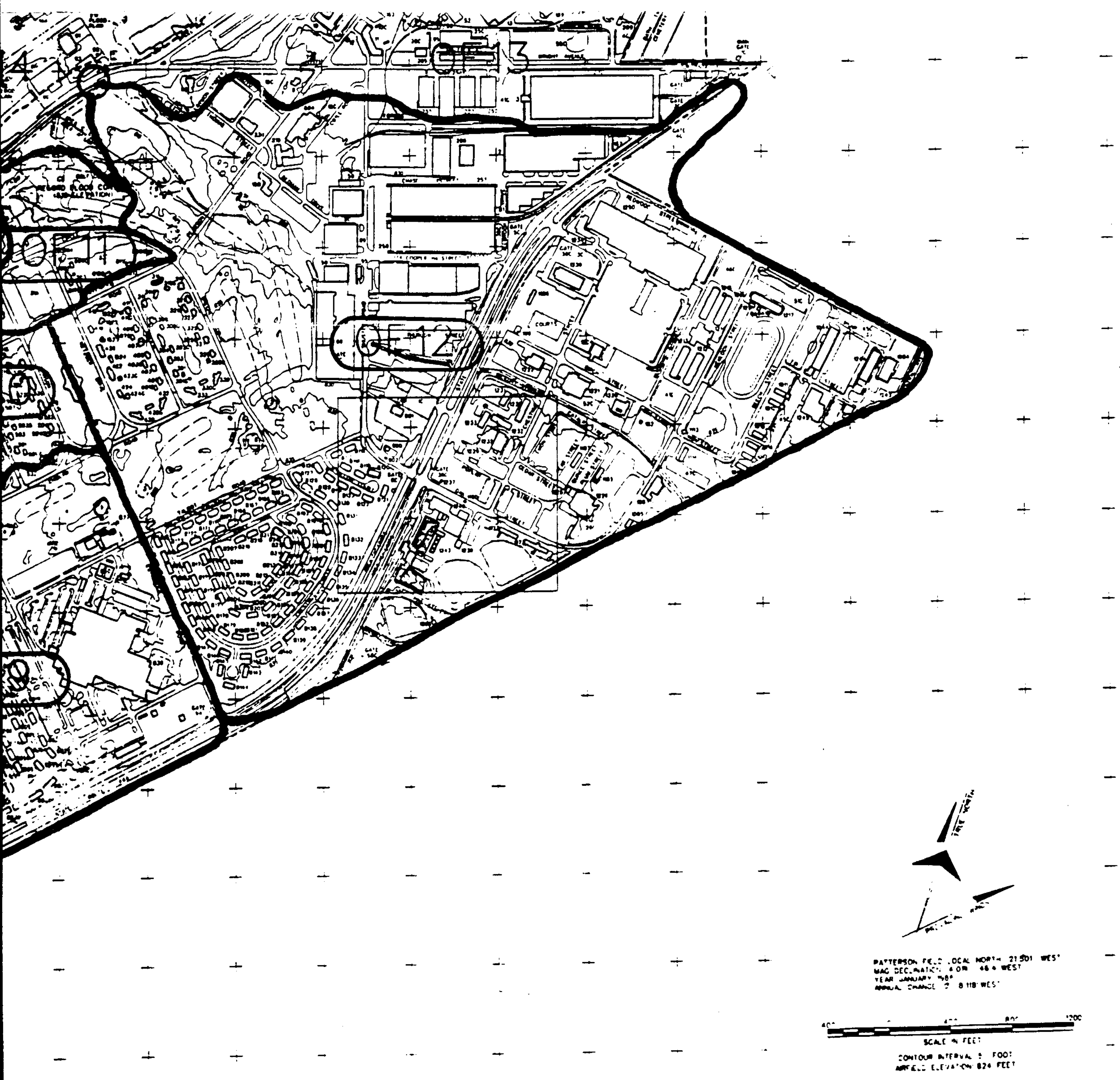
Areas IV and V.

3 of 3

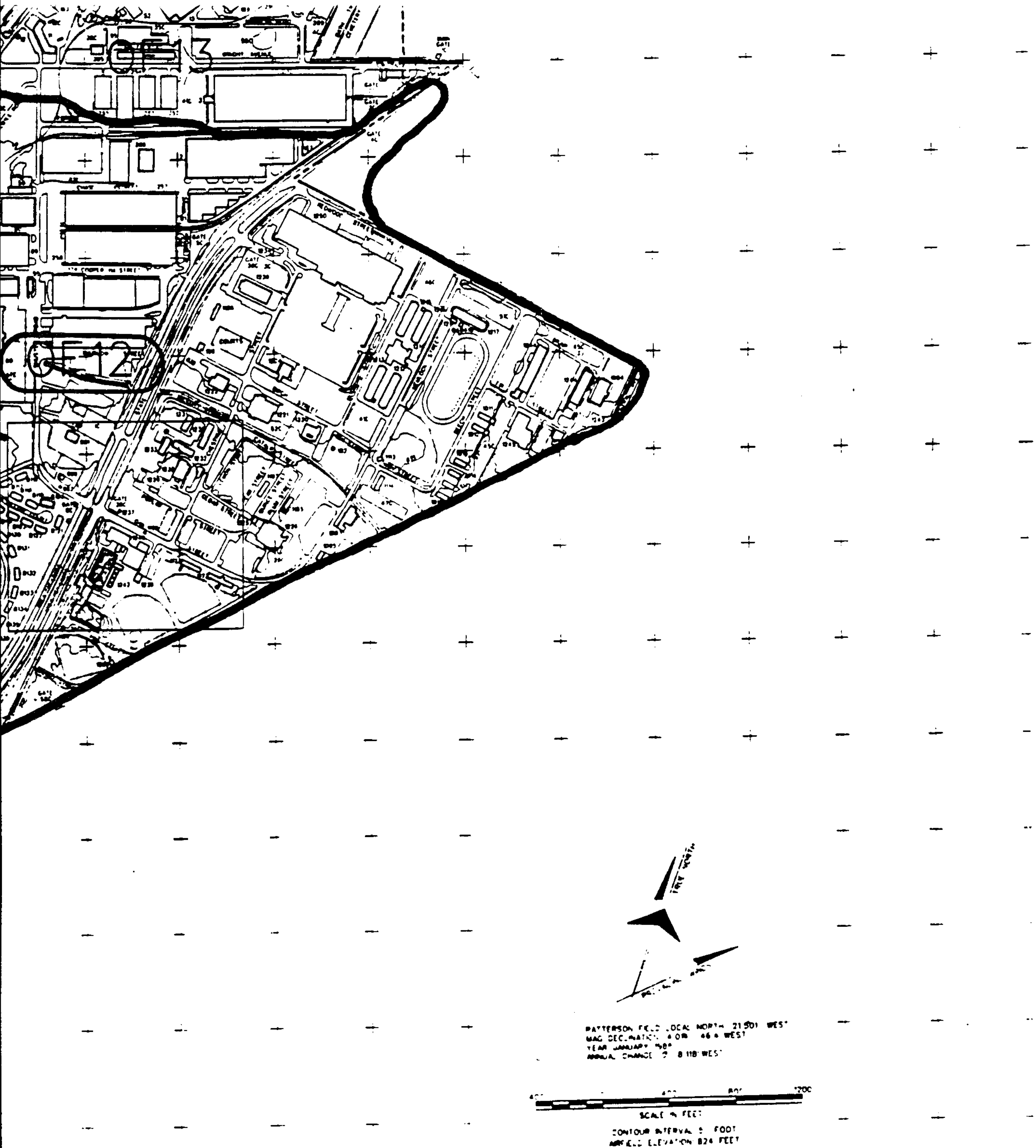


Outfall Areas

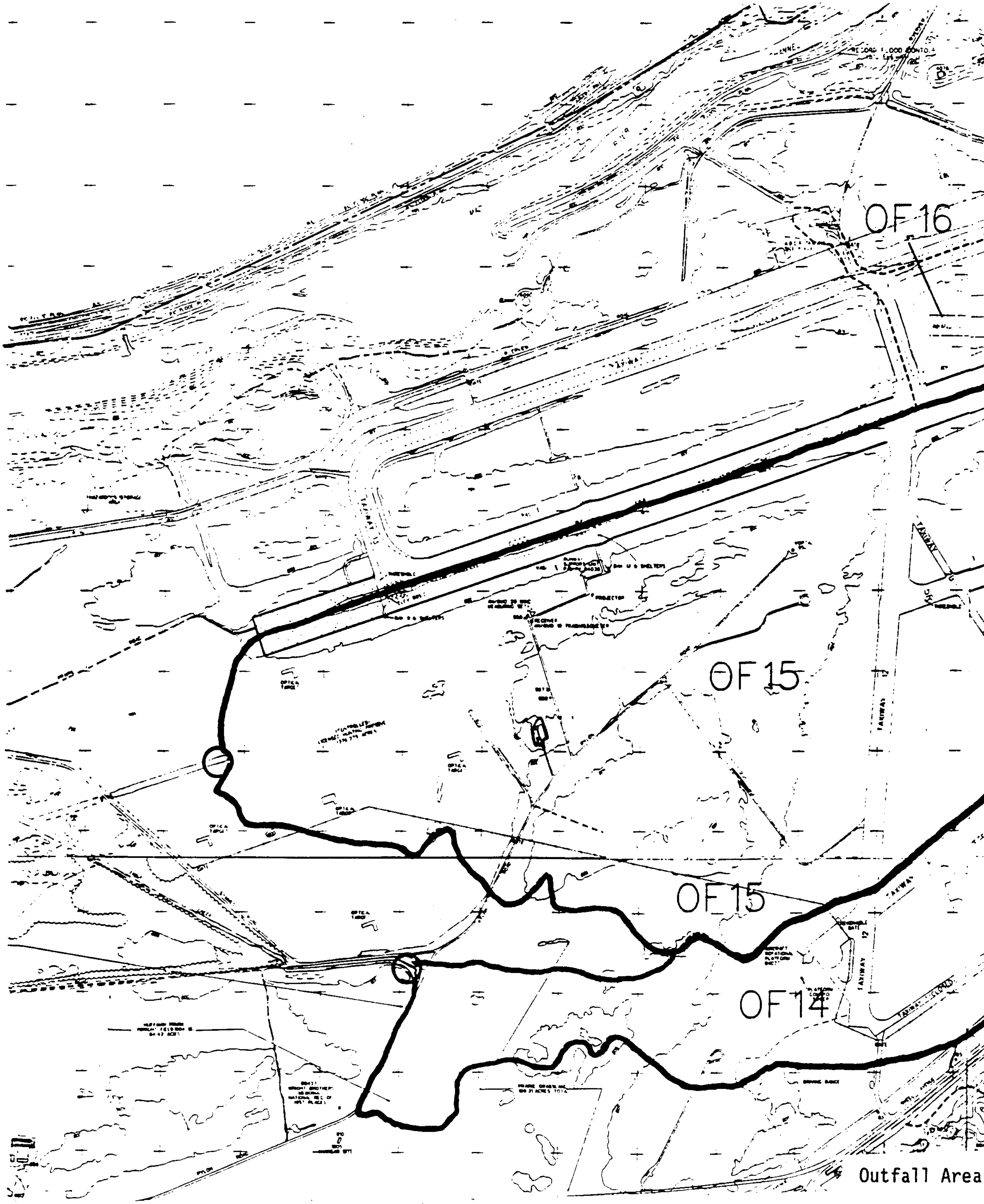
1'3



Outfall Areas 9, 10, 11, and 12.

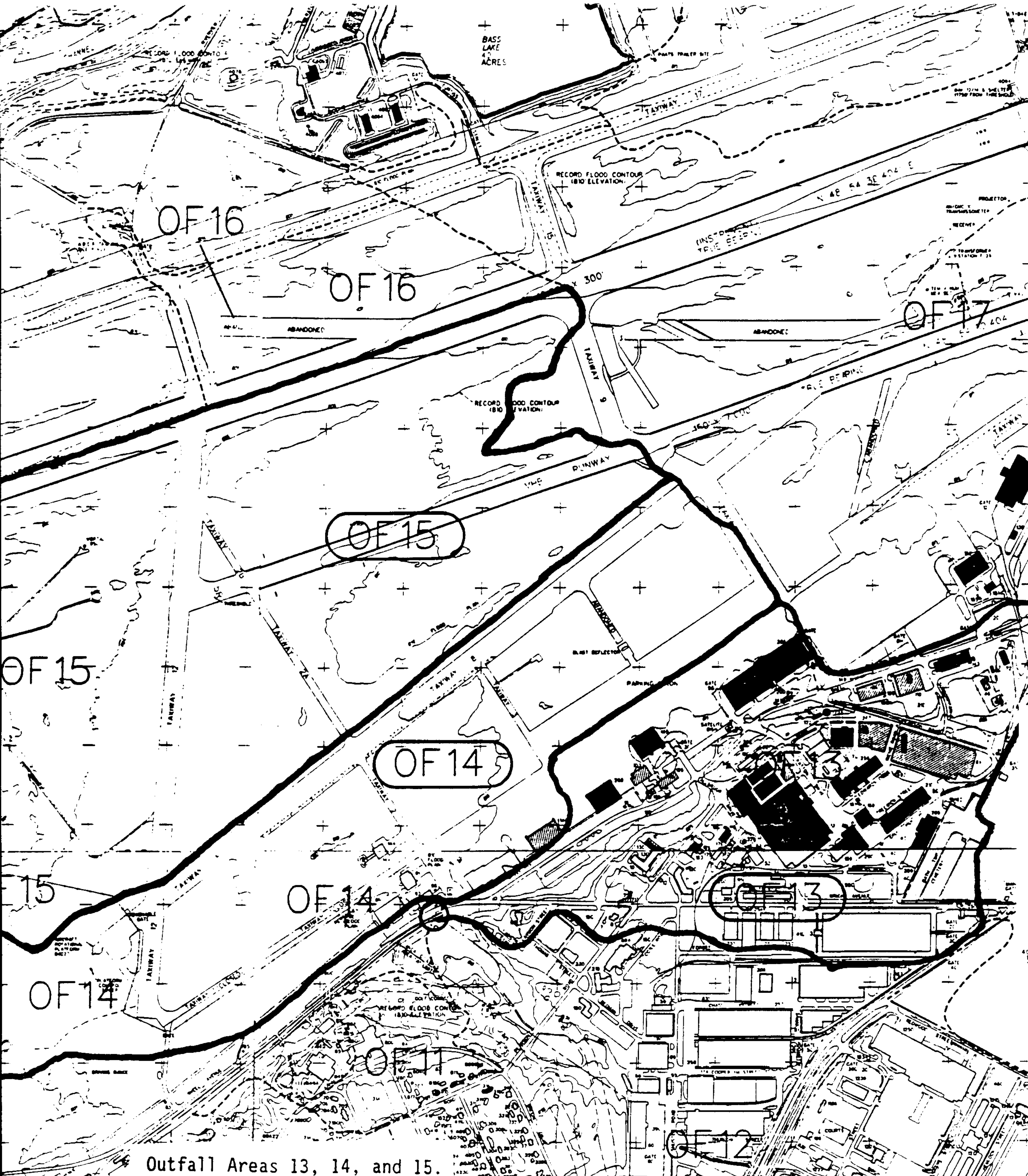


, and 12.



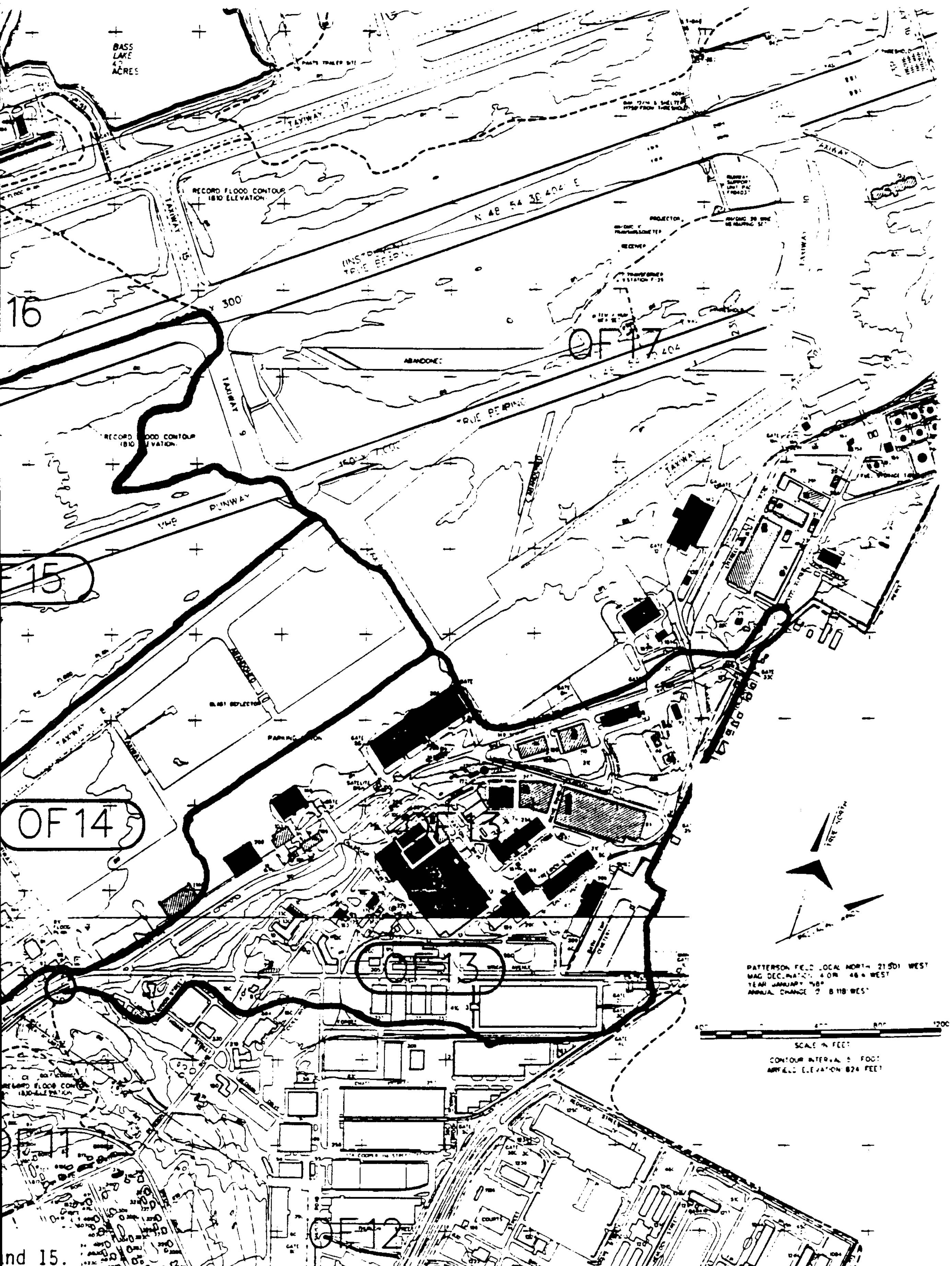
Outfall Areas

16f3



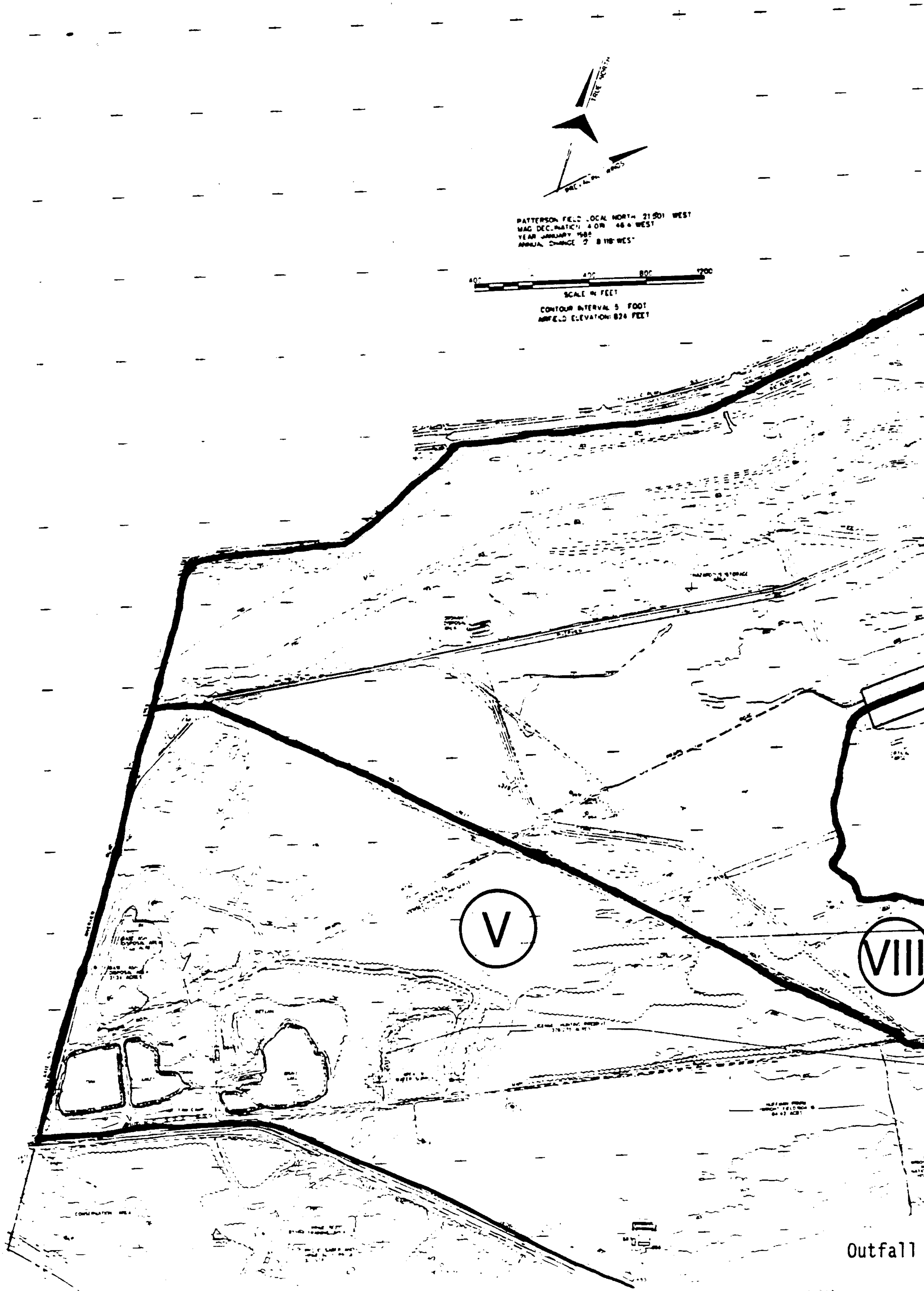
Outfall Areas 13, 14, and 15.

2063

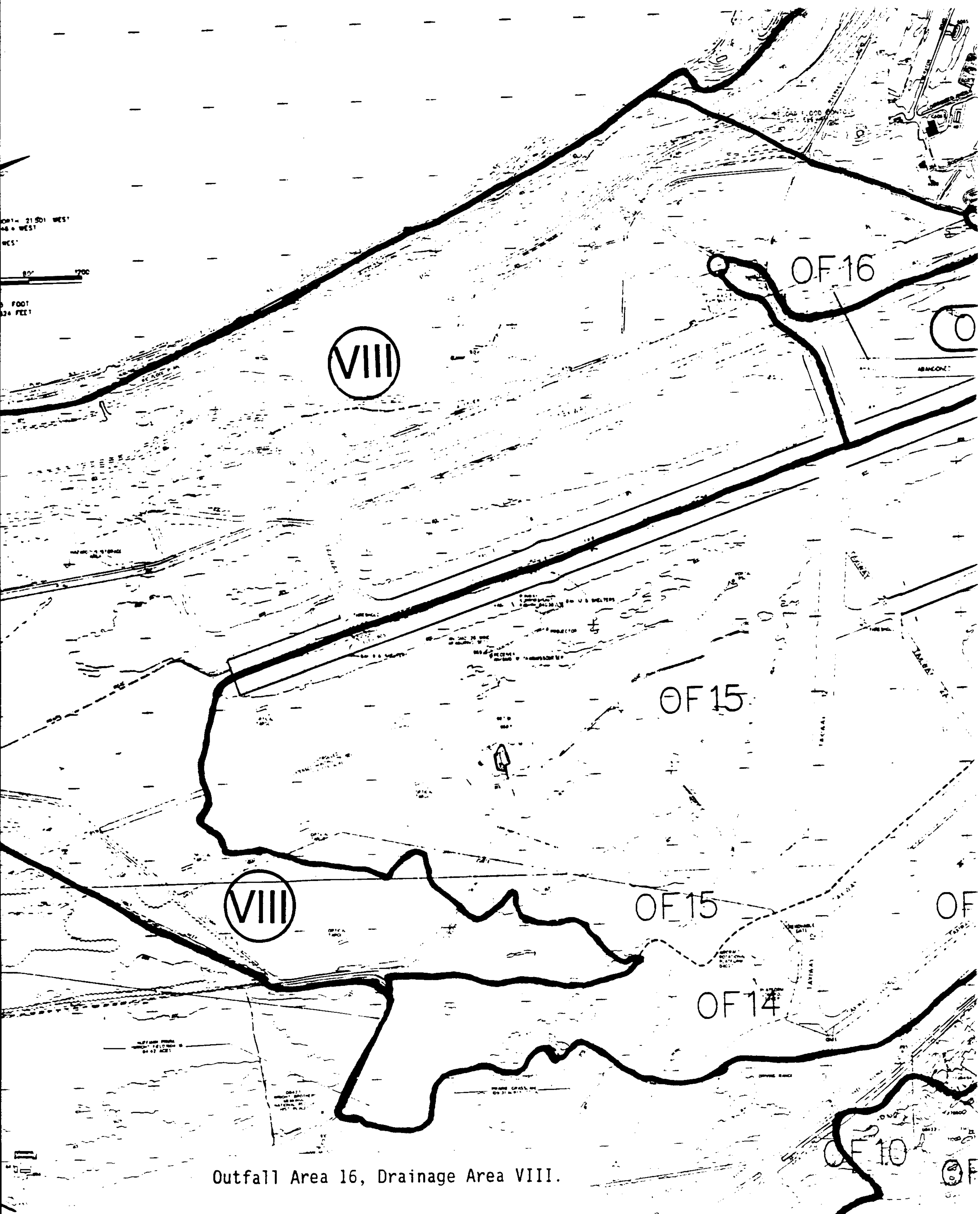

BASS LAKE 42 ACRES
RECORD FLOOD CONTOUR 1810 ELEVATION
TAXIWAY
RUNWAY 300
16
OF 17
ABANDONED
TRUE BEARING
RECORD FLOOD CONTOUR 1810 ELEVATION
TAXIWAY 9
VMF RUNWAY
OF 15
BLAST DEFLECTOR
PARKING
OF 14
OF 13
OF 12
TRUE NORTH
PATTERSON FIELD LOCAL NORTH
MAG DECLINATION
YEAR JANUARY
ANNUAL CHANGE
SCALE IN FEET
CONTOUR INTERVAL 5 FOOT
AIRFIELD ELEVATION 824 FEET

nd 15.

3063

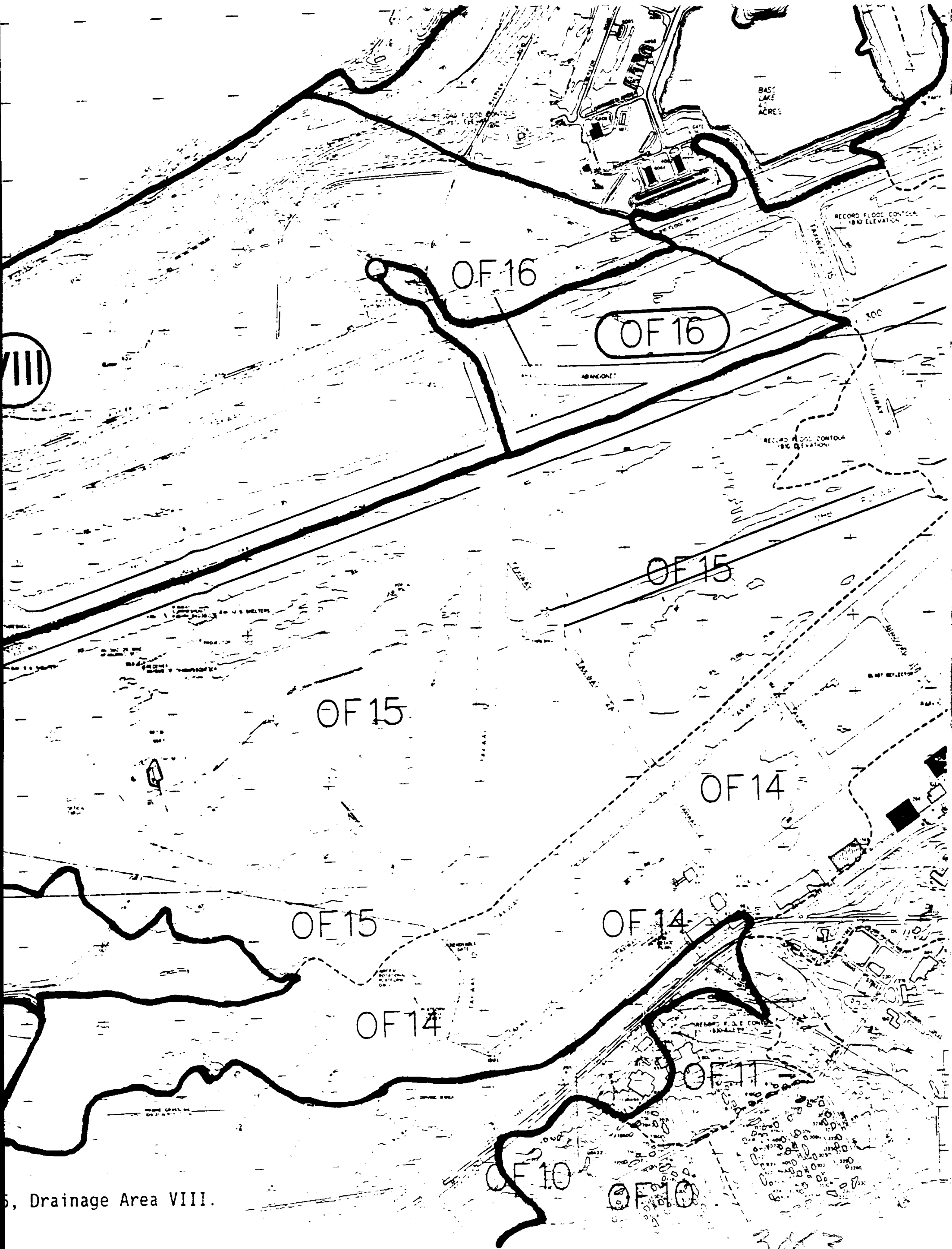


1113



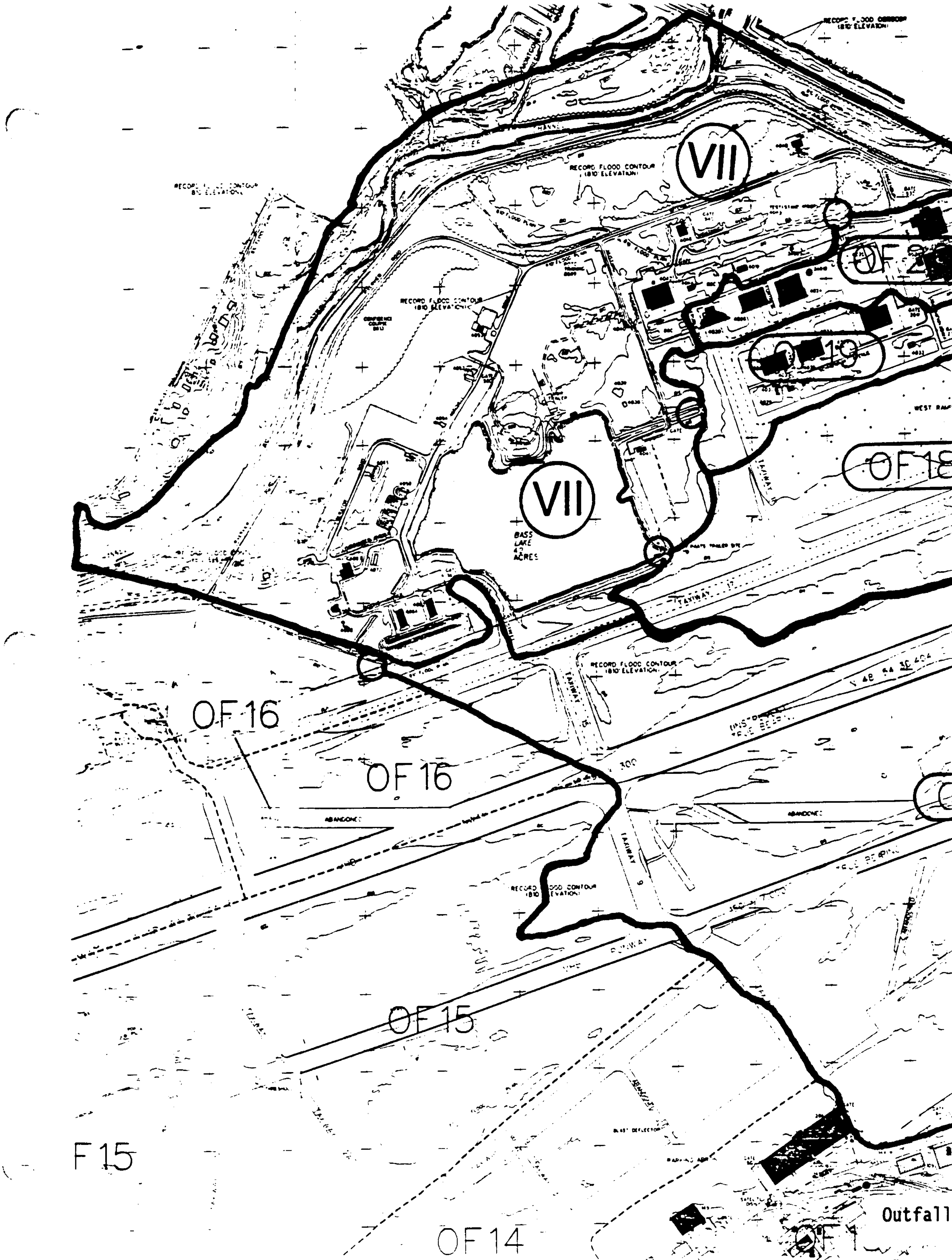
Outfall Area 16, Drainage Area VIII.

2 of 3

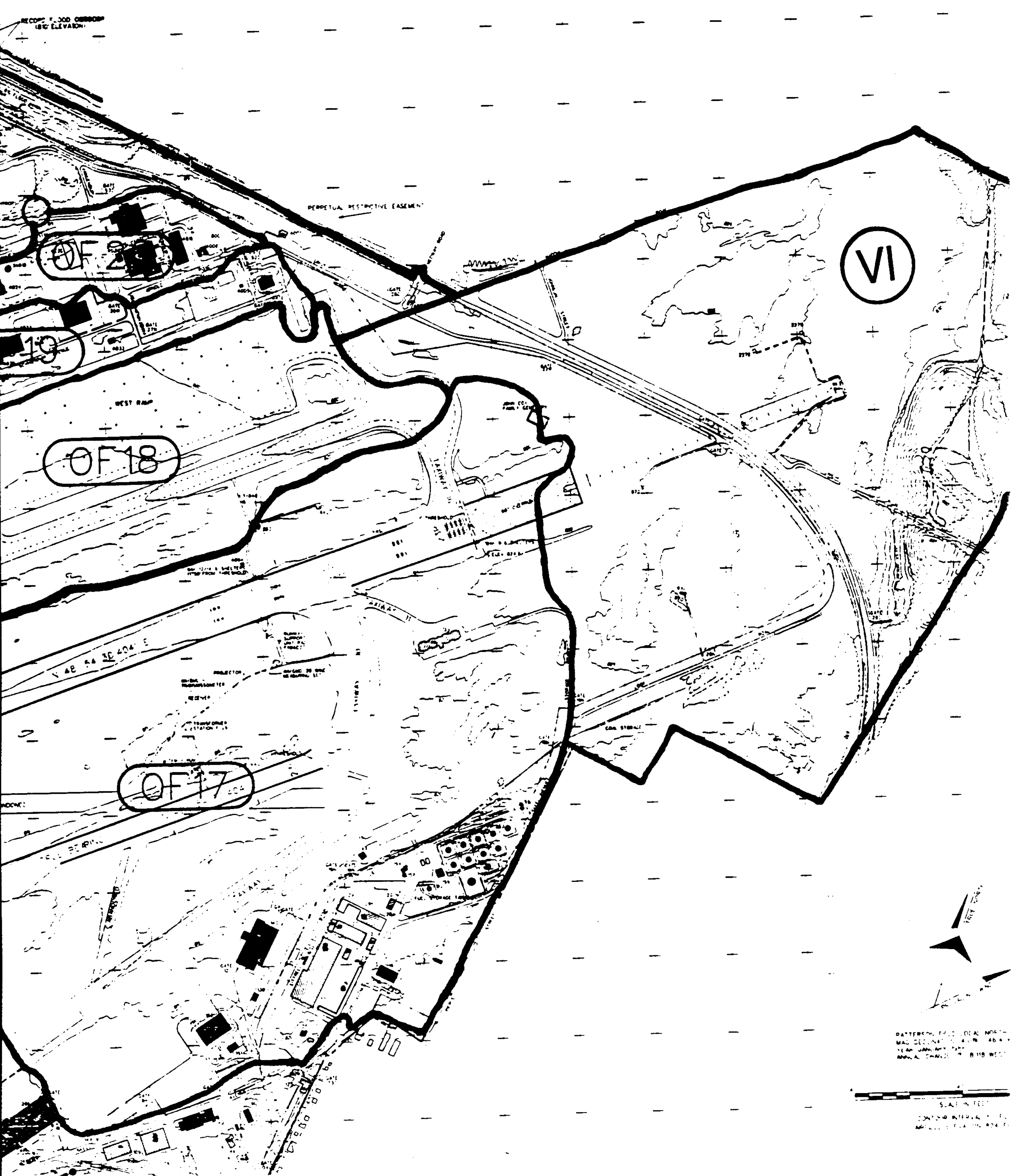


5, Drainage Area VIII.

3683

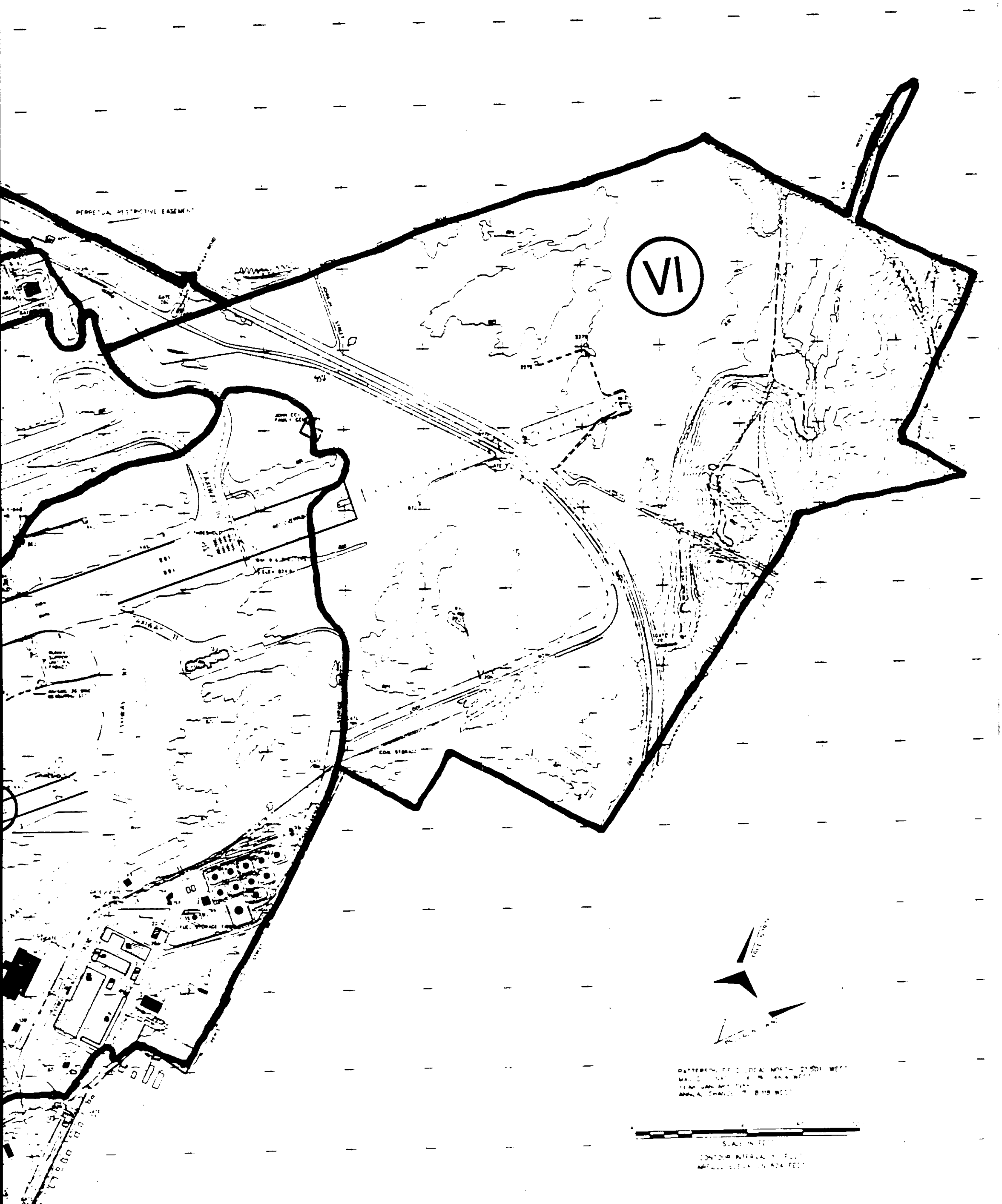


VII
RECORD FLOOD CONTOUR (810' ELEVATION)
VII
BASS LAKE 43 ACRES
OF 19
OF 18
OF 16
OF 16
TAXIWAY
ABANDONED
OF 15
F15
OF 14
Outfall
OF 1

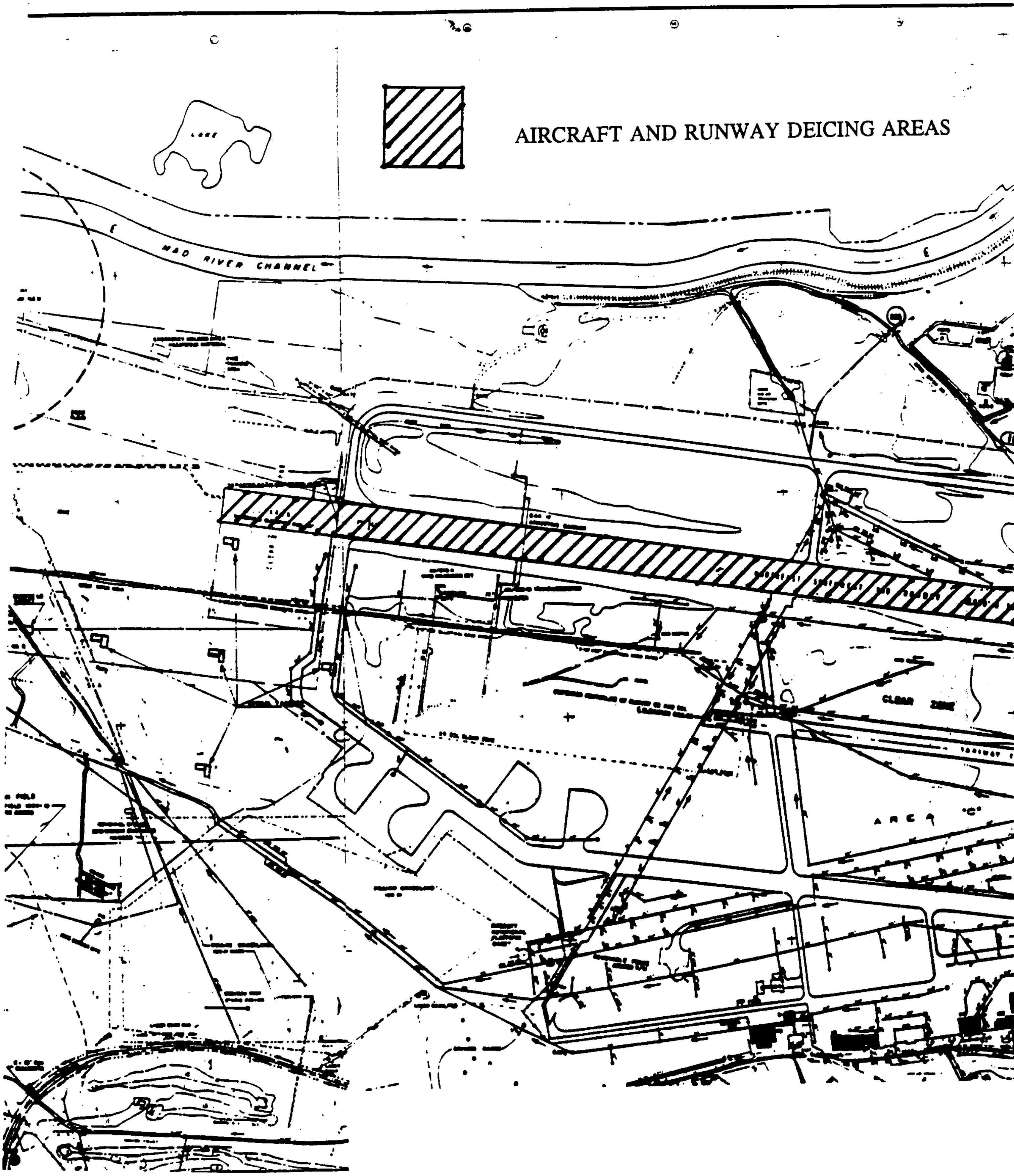


Outfall Areas 17, 18, 19, and 20, Drainage Areas VI and VII.

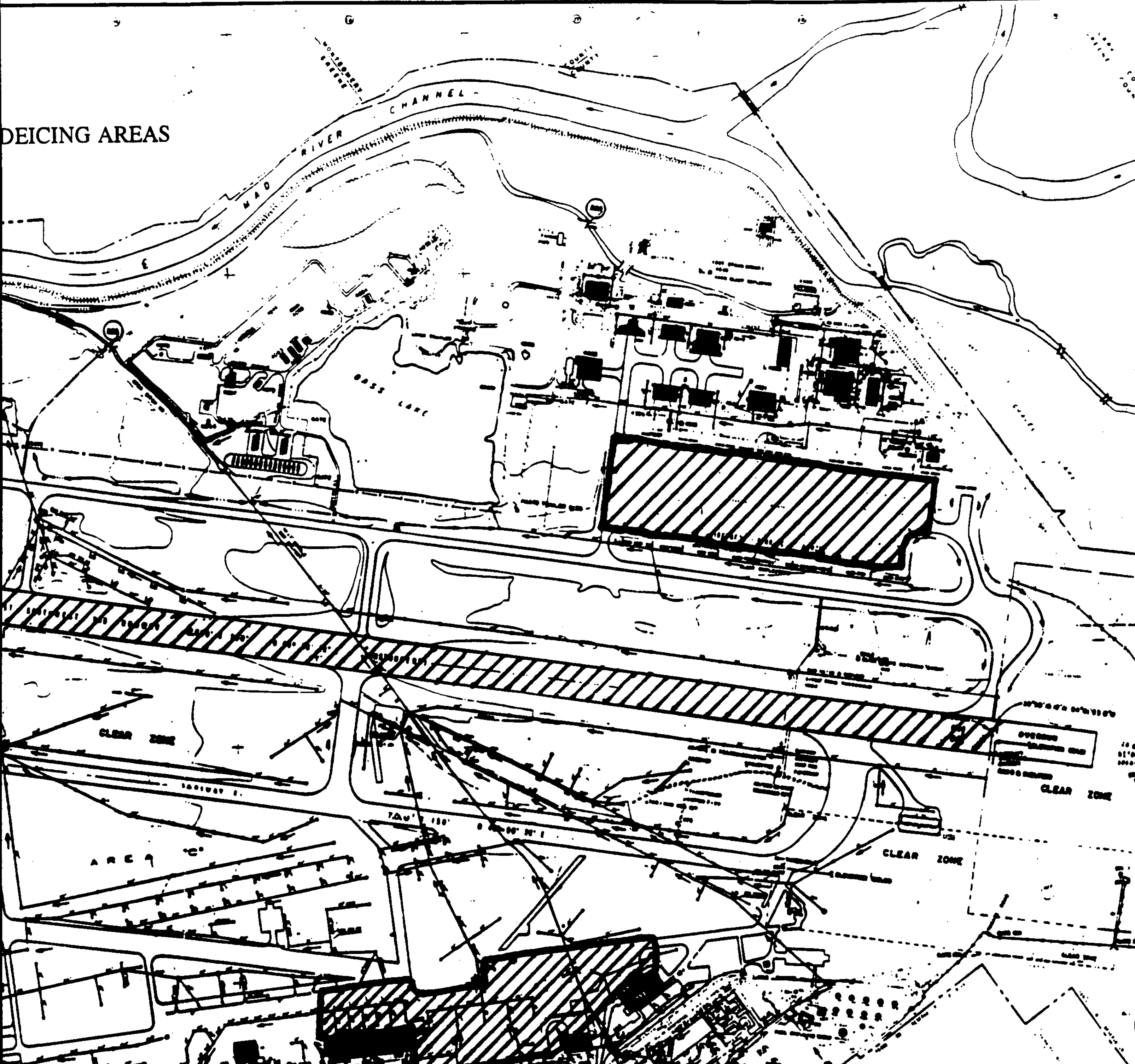
2063



7, 18, 19, and 20, Drainage Areas VI and VII.

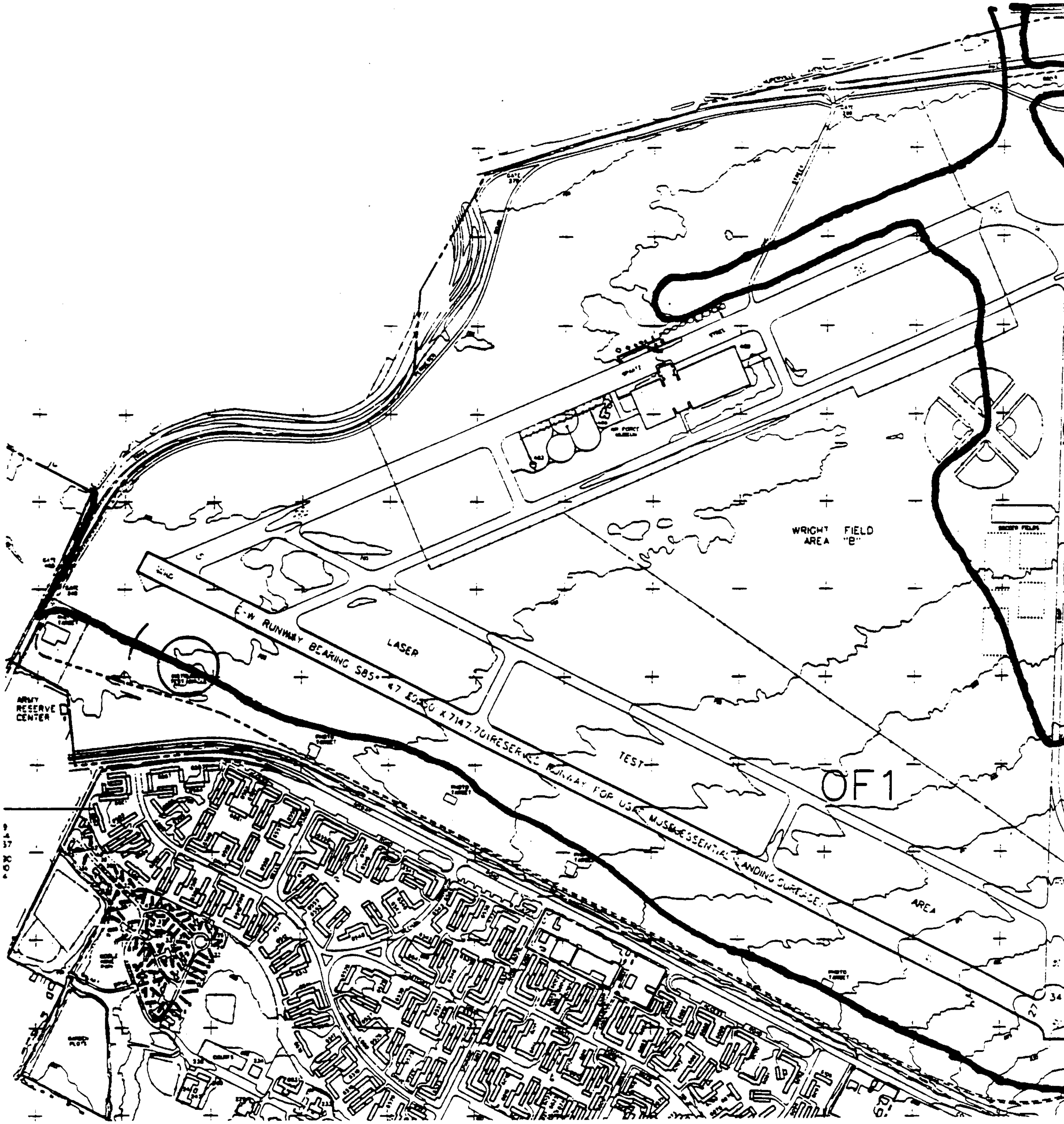

AIRCRAFT AND RUNWAY DEICING AREAS
MAD RIVER CHANNEL
CLEAR ZONE

DEICING AREAS



263

383

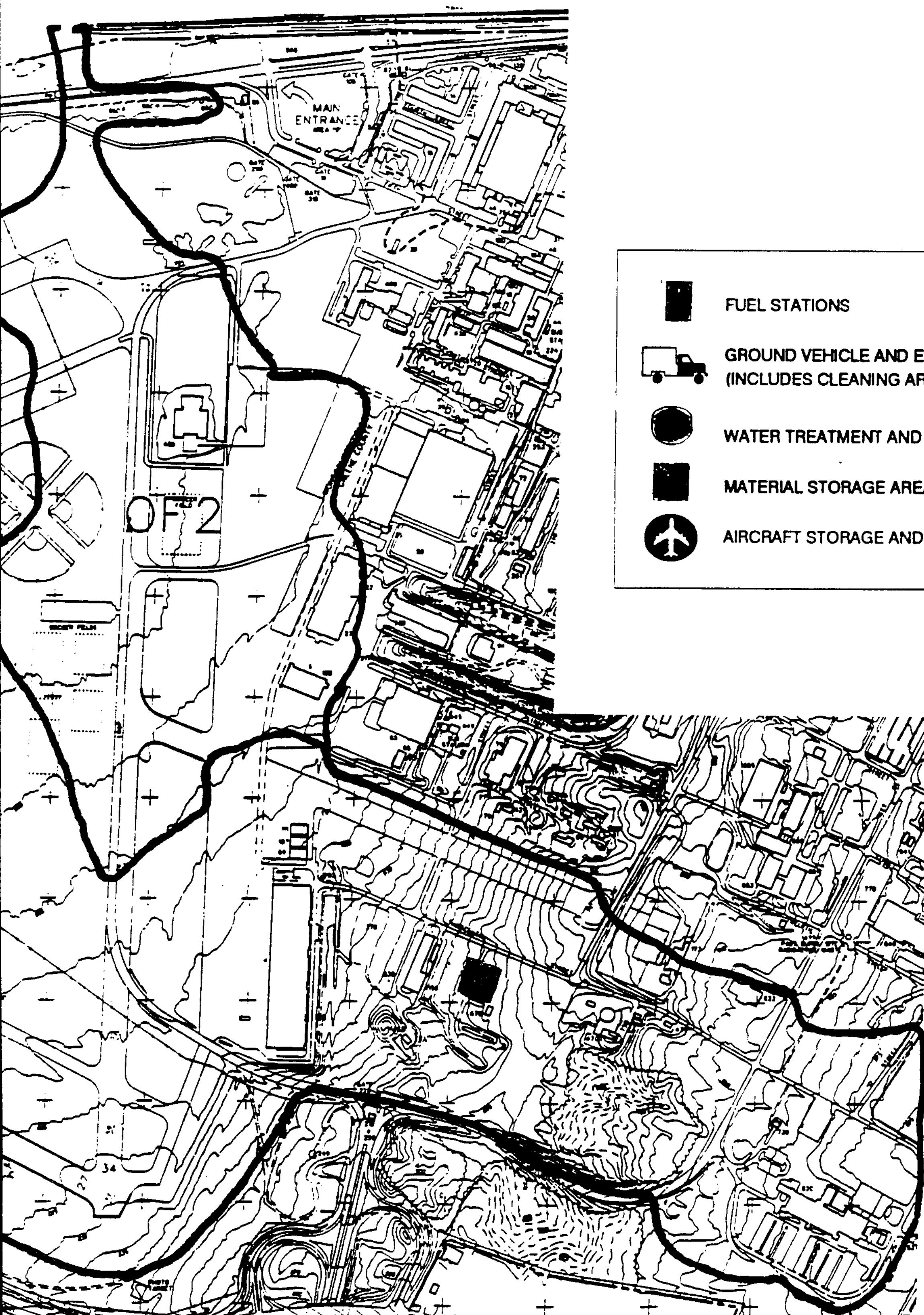


LIQUID STORAGE TANKS - OUTFALLS 1

148

)UTFALLS 1 AND 2

OTHER SIGNIFICANT ACTIVITIES - (



FUEL STATIONS

GROUND VEHICLE AND EQUIPMENT MAINTENANCE (INCLUDES CLEANING AREAS)

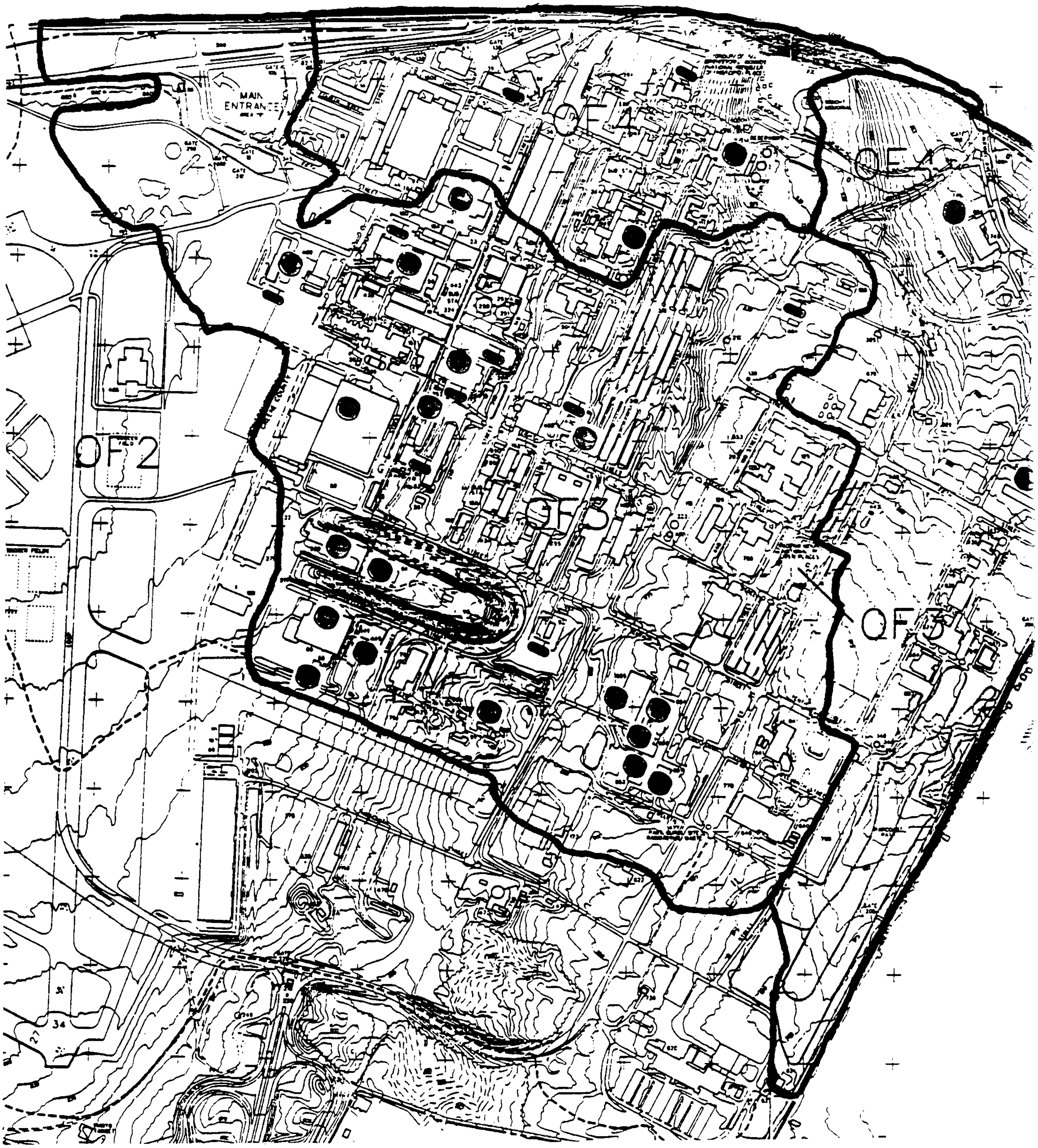
WATER TREATMENT AND STORAGE

MATERIAL STORAGE AREAS EXPOSED TO PRECIPITATION

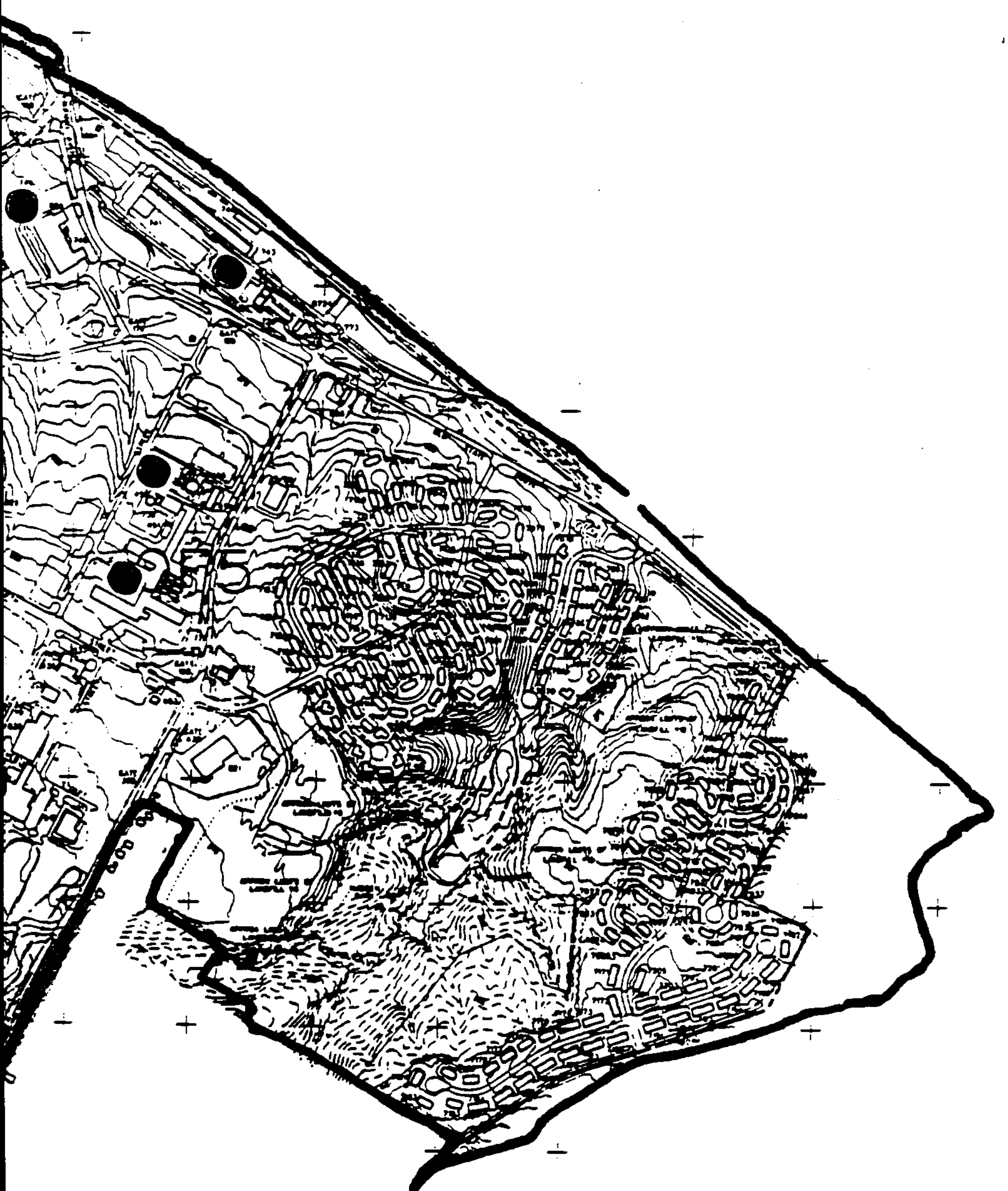
AIRCRAFT STORAGE AND MAINTENANCE AREAS

TIVITIES - OUTFALLS 1 AND 2

2 of 2



LIQUID STORAGE TANKS - OUTFALLS

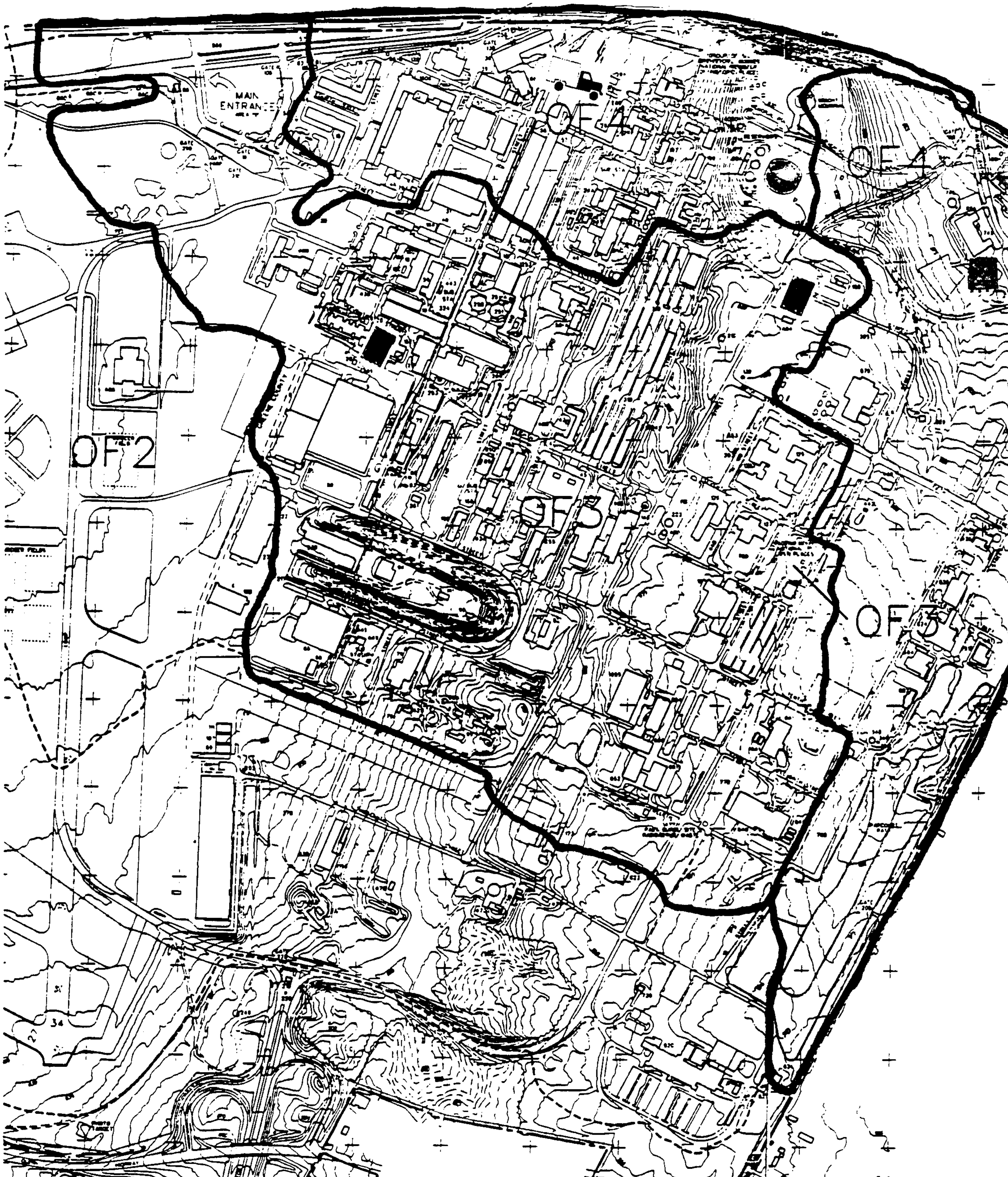


UNDERGROUND STORAGE TANK(S)
(CAPACITY GREATER THAN 5,000 GALLONS)

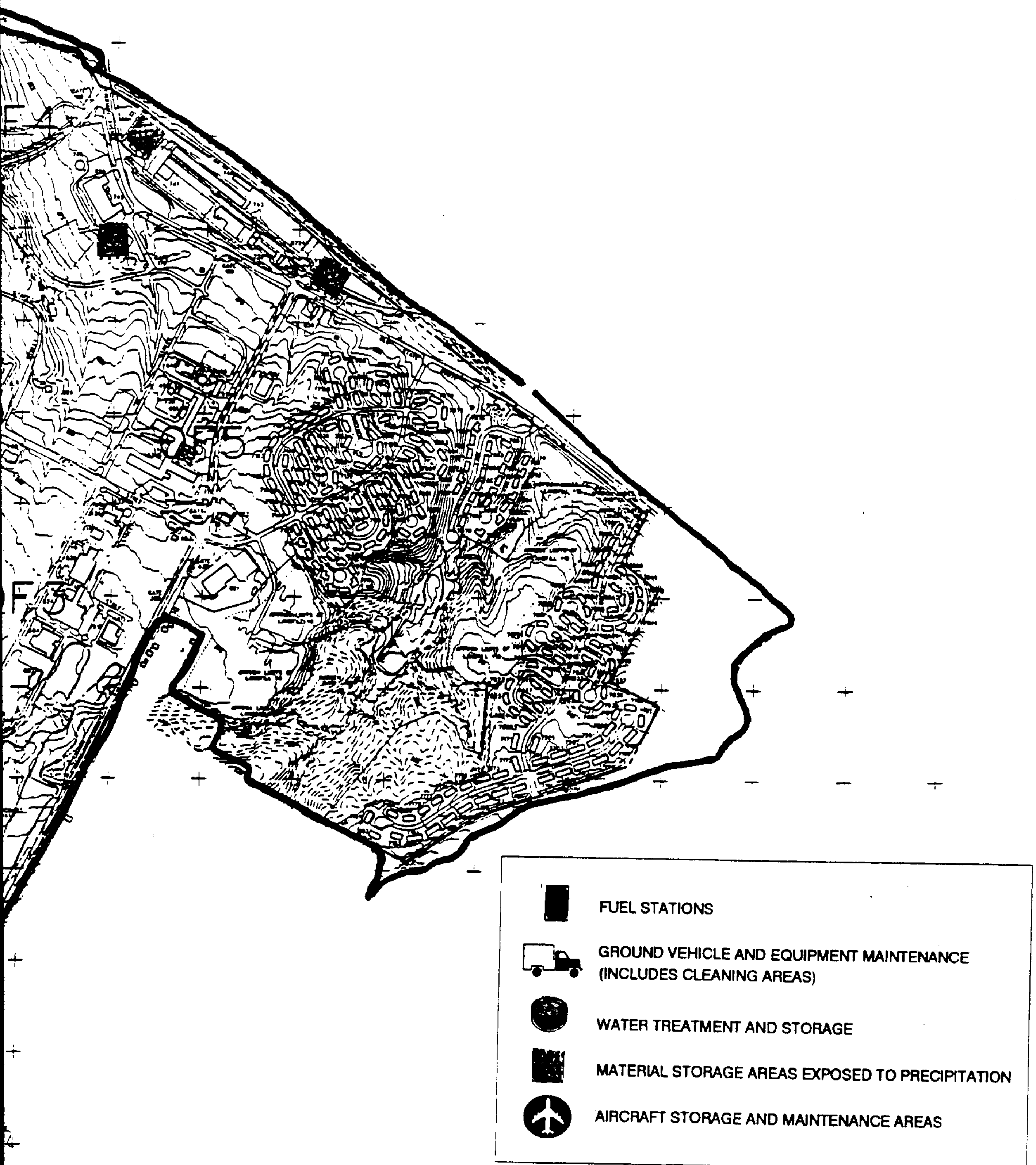
ABOVE GROUND STORAGE TANK(S)
(CAPACITY GREATER THAN 650 GALLONS)

TFALLS 3, 4, AND 5

2/62

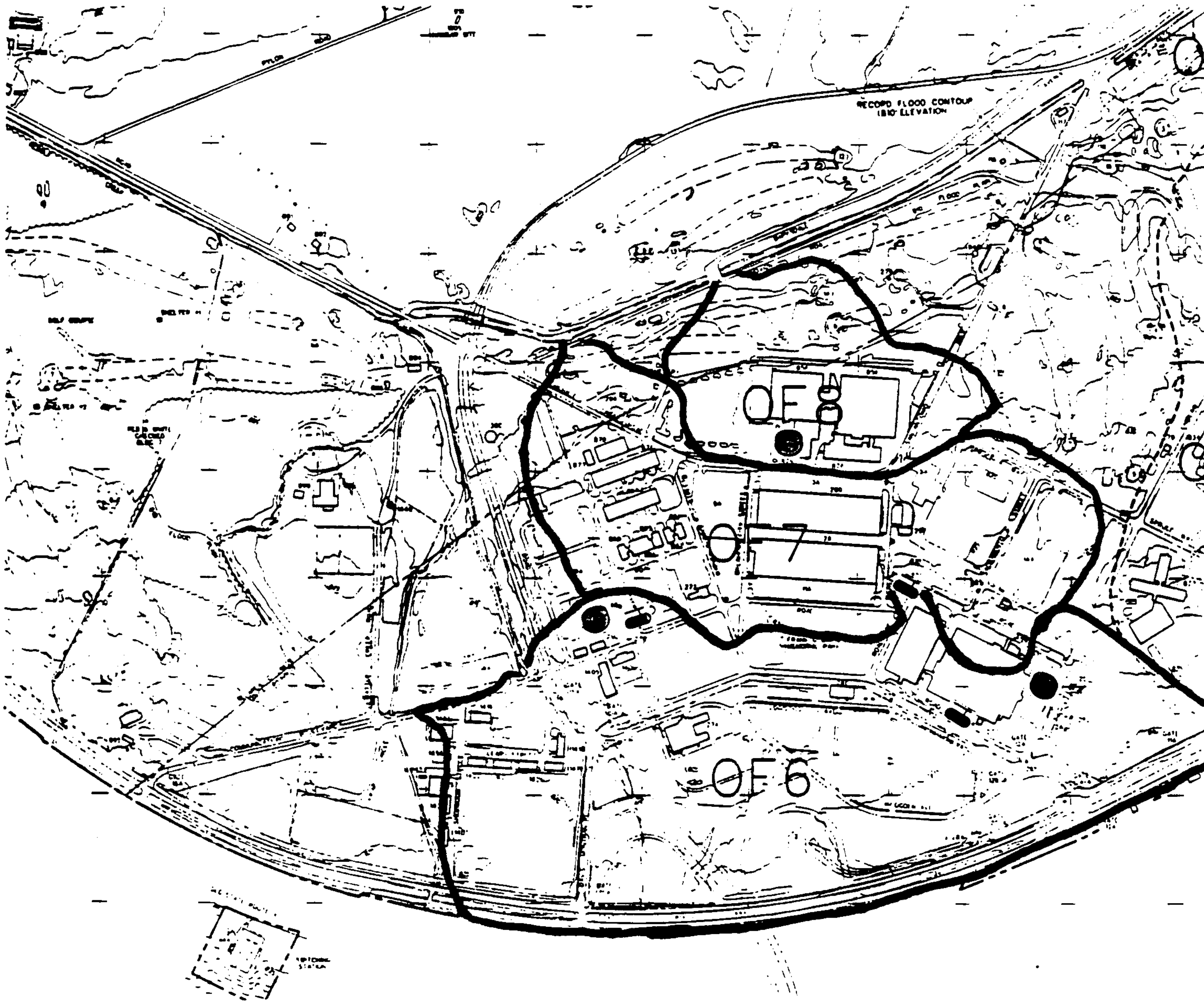


OTHER SIGNIFICANT ACTIVITIES - OUT



/ITIES - OUTFALLS 3, 4, AND 5

2 of 2



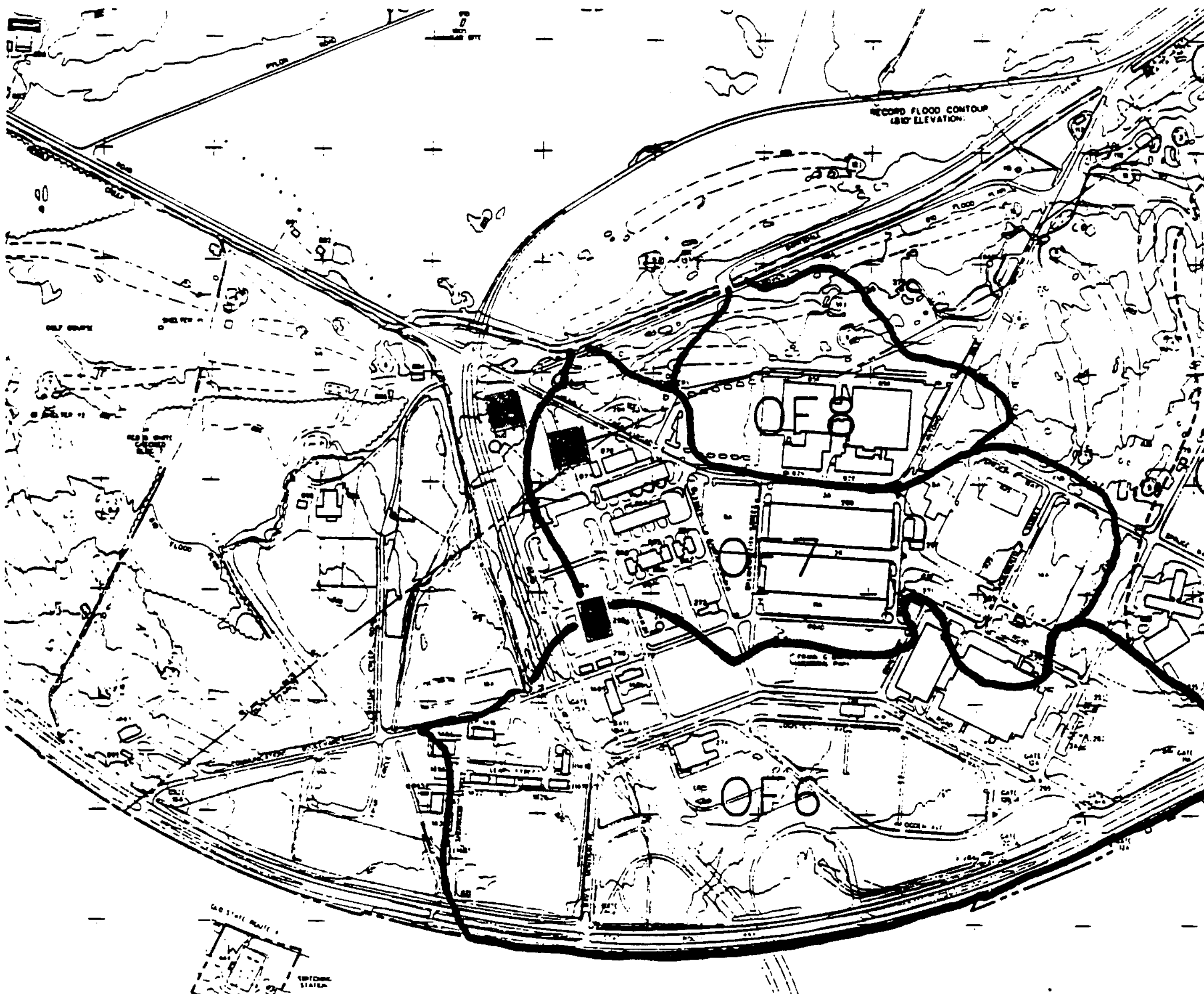
LIQUID STORAGE TANKS - OUTFA

UNDERGROUND STORAGE TANK(S)
(CAPACITY GREATER THAN 5,000 GALLONS)

ABOVE GROUND STORAGE TANK(S)
(CAPACITY GREATER THAN 650 GALLONS)

)RAGE TANKS - OUTFALLS 6, 7, AND 8

8 4 2



OTHER SIGNIFICANT ACTIVITI

FUEL STATIONS

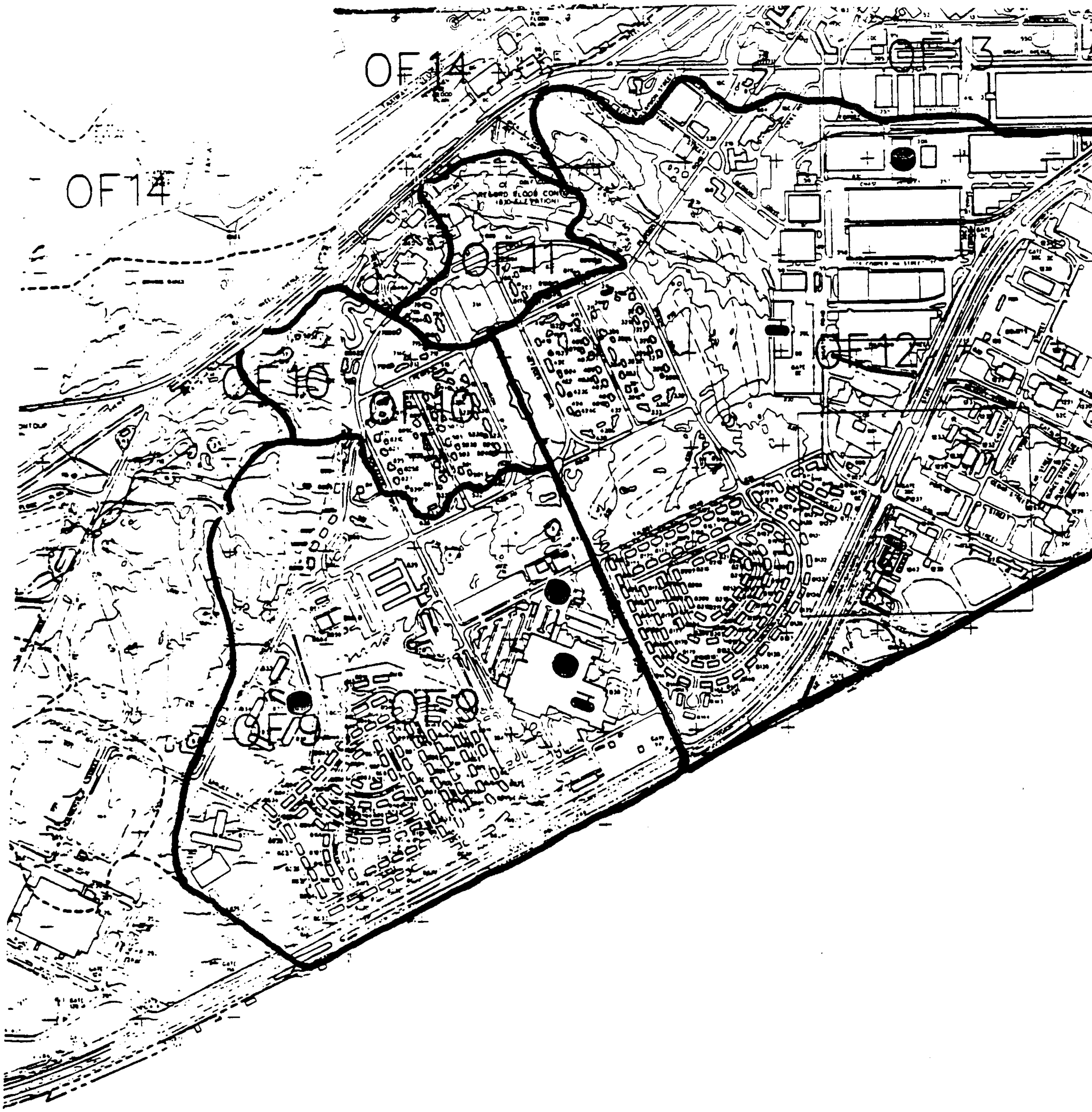
GROUND VEHICLE AND EQUIPMENT MAINTENANCE (INCLUDES CLEANING AREAS)

WATER TREATMENT AND STORAGE

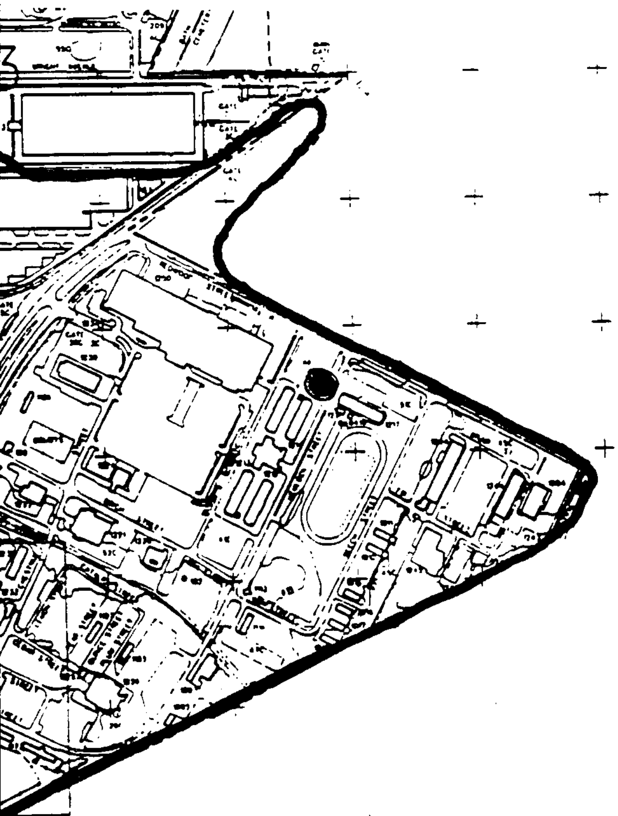
MATERIAL STORAGE AREAS EXPOSED TO PRECIPITATION

AIRCRAFT STORAGE AND MAINTENANCE AREAS

NT ACTIVITIES - OUTFALLS 6, 7, AND 8



LIQUID STORAGE TANKS - OUTF

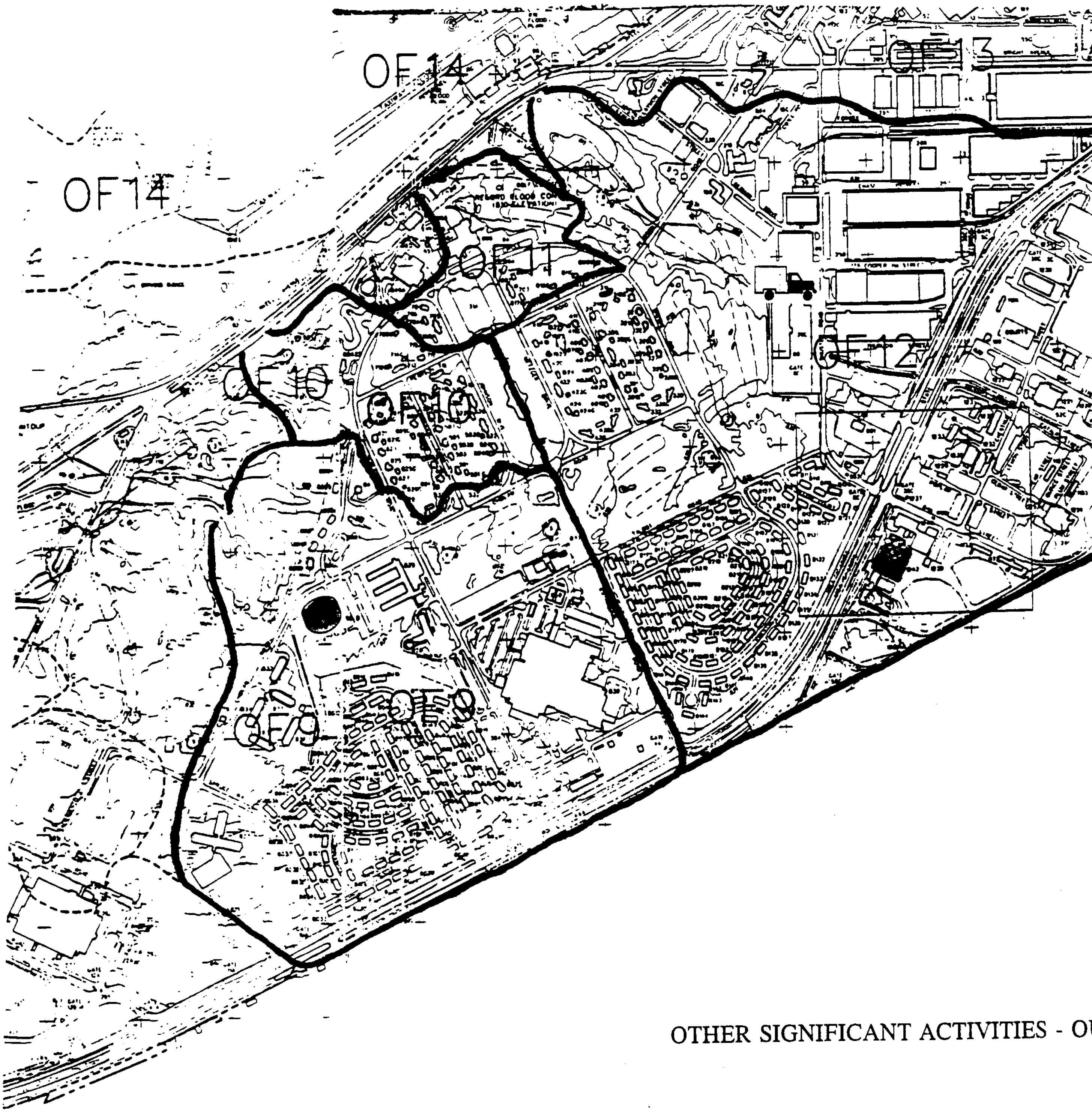


UNDERGROUND STORAGE TANK(S)
(CAPACITY GREATER THAN 5,000 GALLONS)

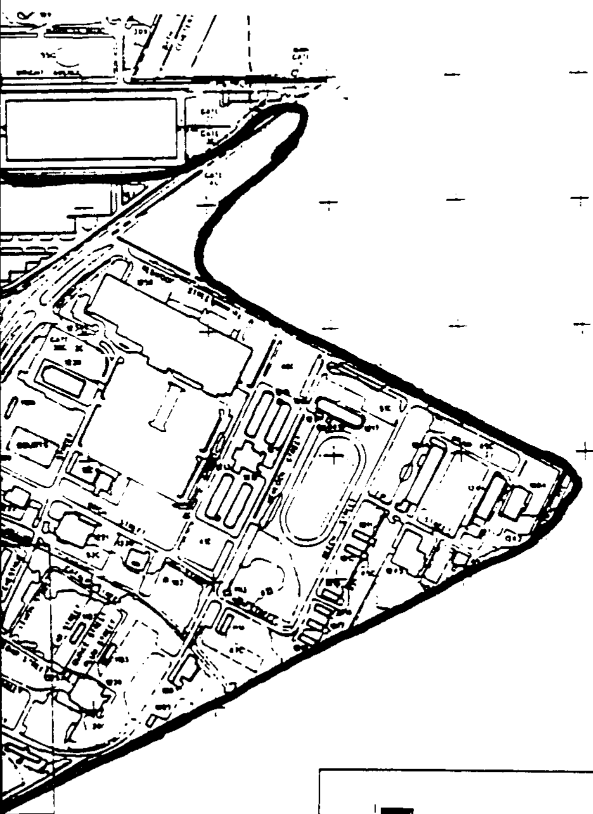
ABOVE GROUND STORAGE TANK(S)
(CAPACITY GREATER THAN 650 GALLONS)

KS - OUTFALLS 9, 10, 11, AND 12

2 of 2



OTHER SIGNIFICANT ACTIVITIES - OU



FUEL STATIONS

GROUND VEHICLE AND EQUIPMENT MAINTENANCE (INCLUDES CLEANING AREAS)

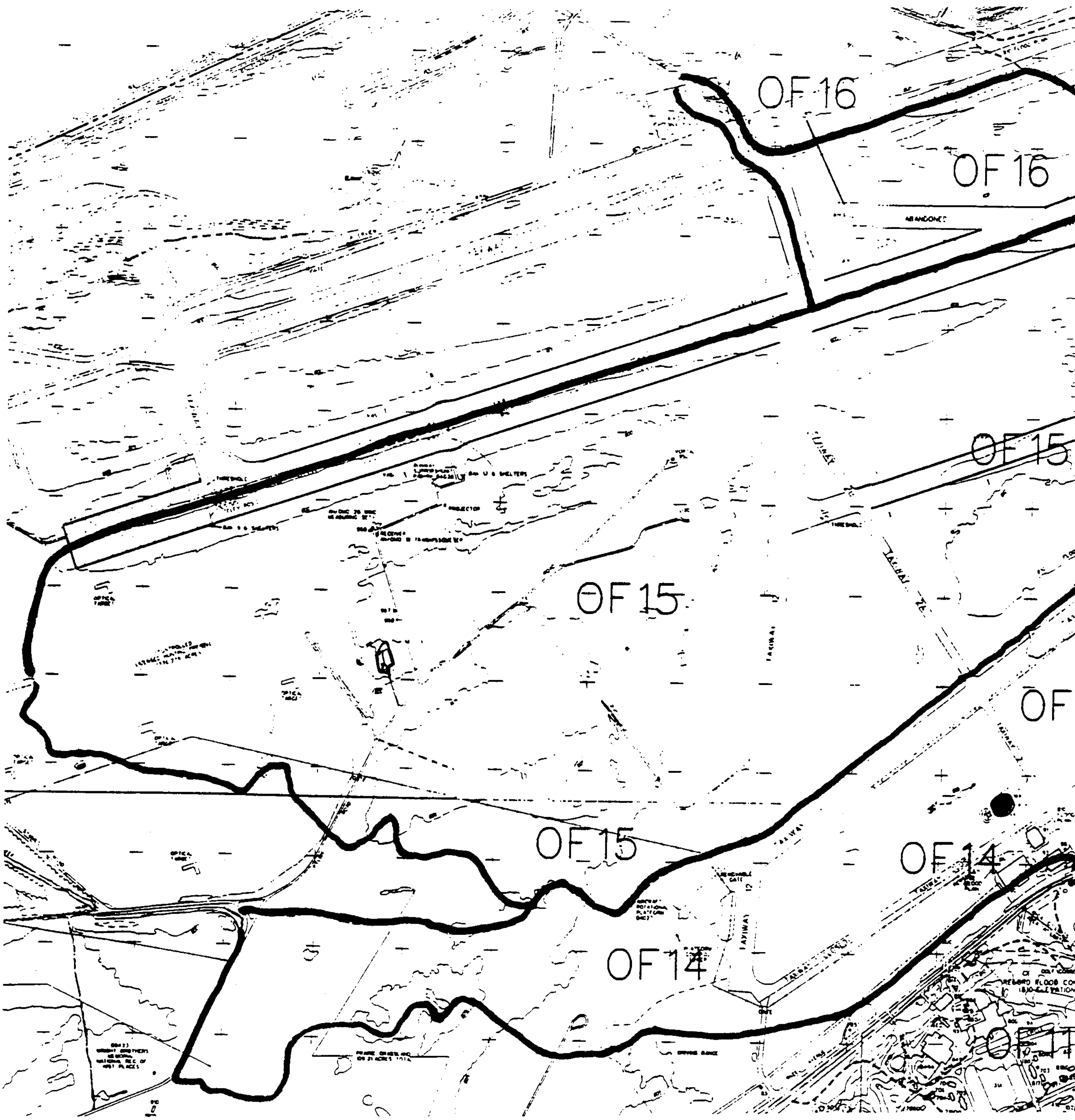
WATER TREATMENT AND STORAGE

MATERIAL STORAGE AREAS EXPOSED TO PRECIPITATION

AIRCRAFT STORAGE AND MAINTENANCE AREAS

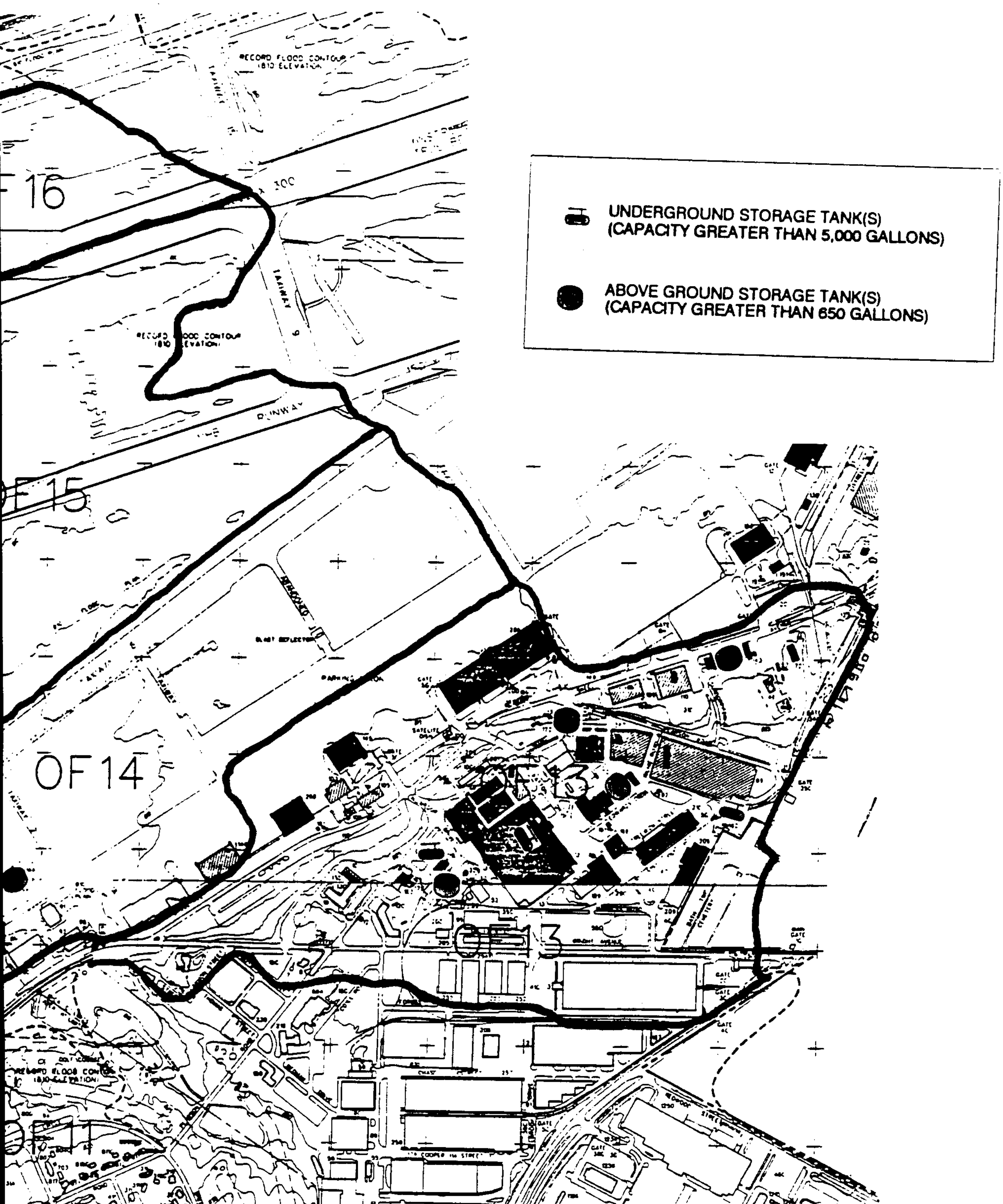
TIES - OUTFALLS 9, 10, 11, AND 12

A82



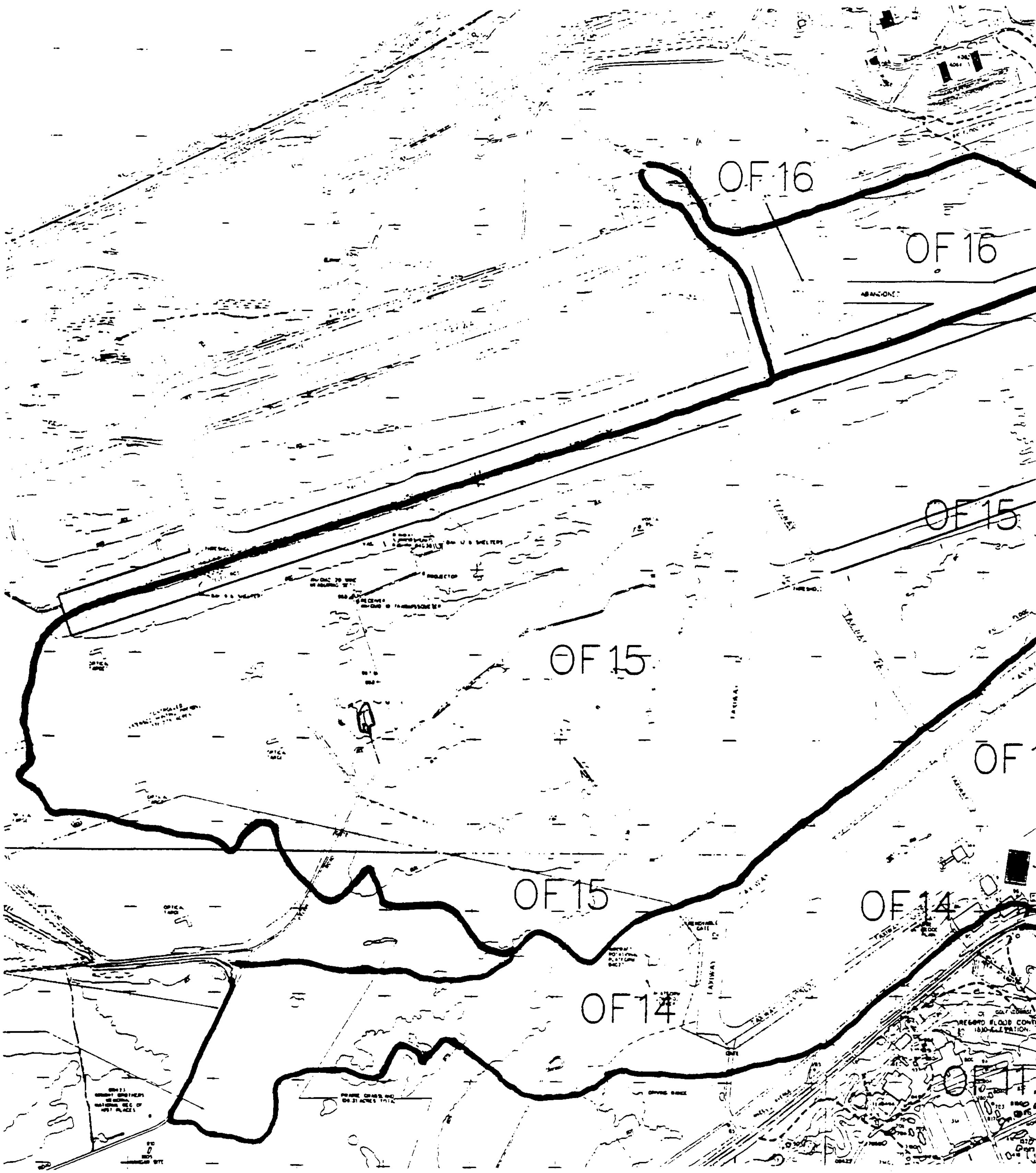
LIQUID STORAGE TANKS - OUTFALI

1682



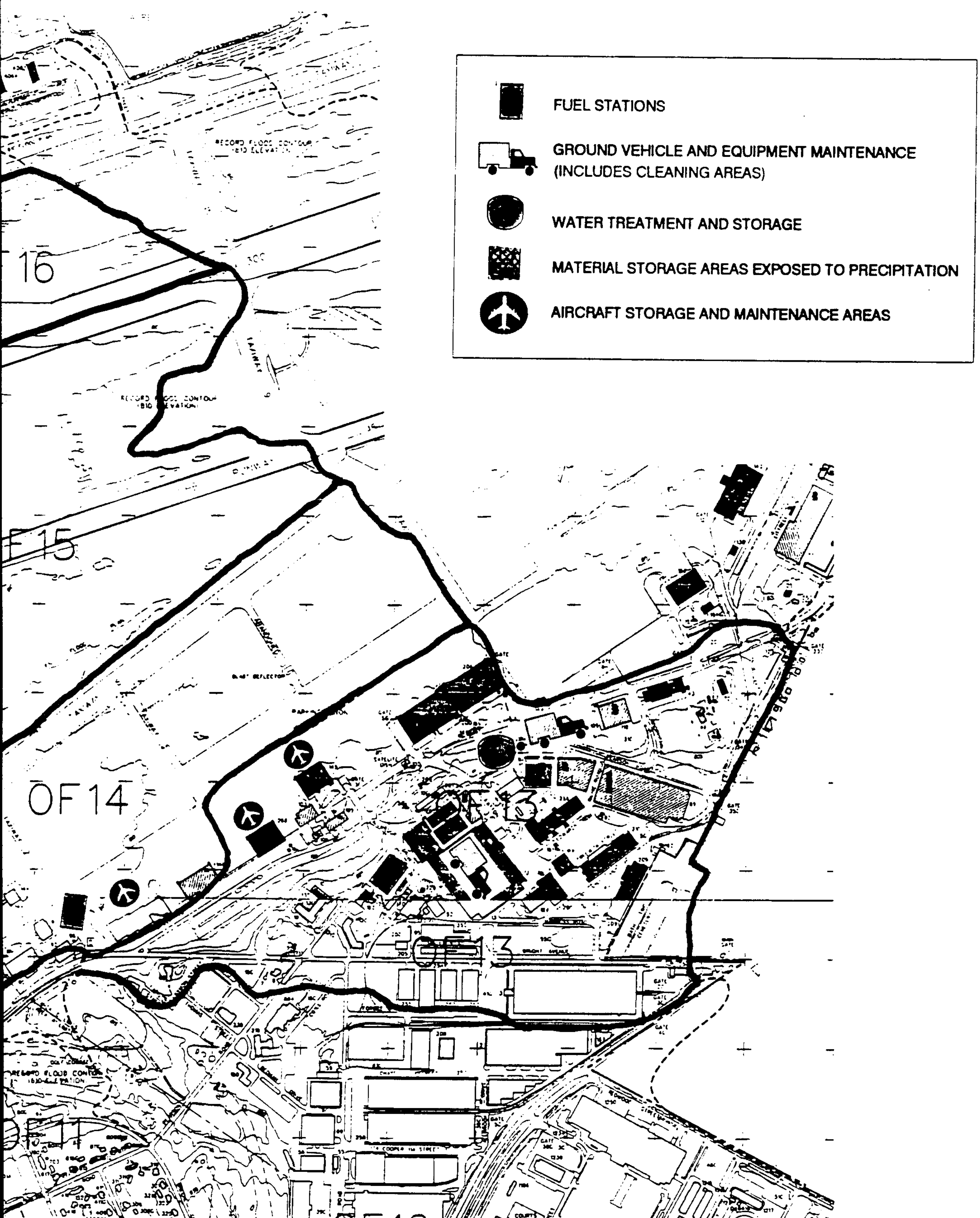
UTFALLS 13, 14, 15, AND 16

2 of 2



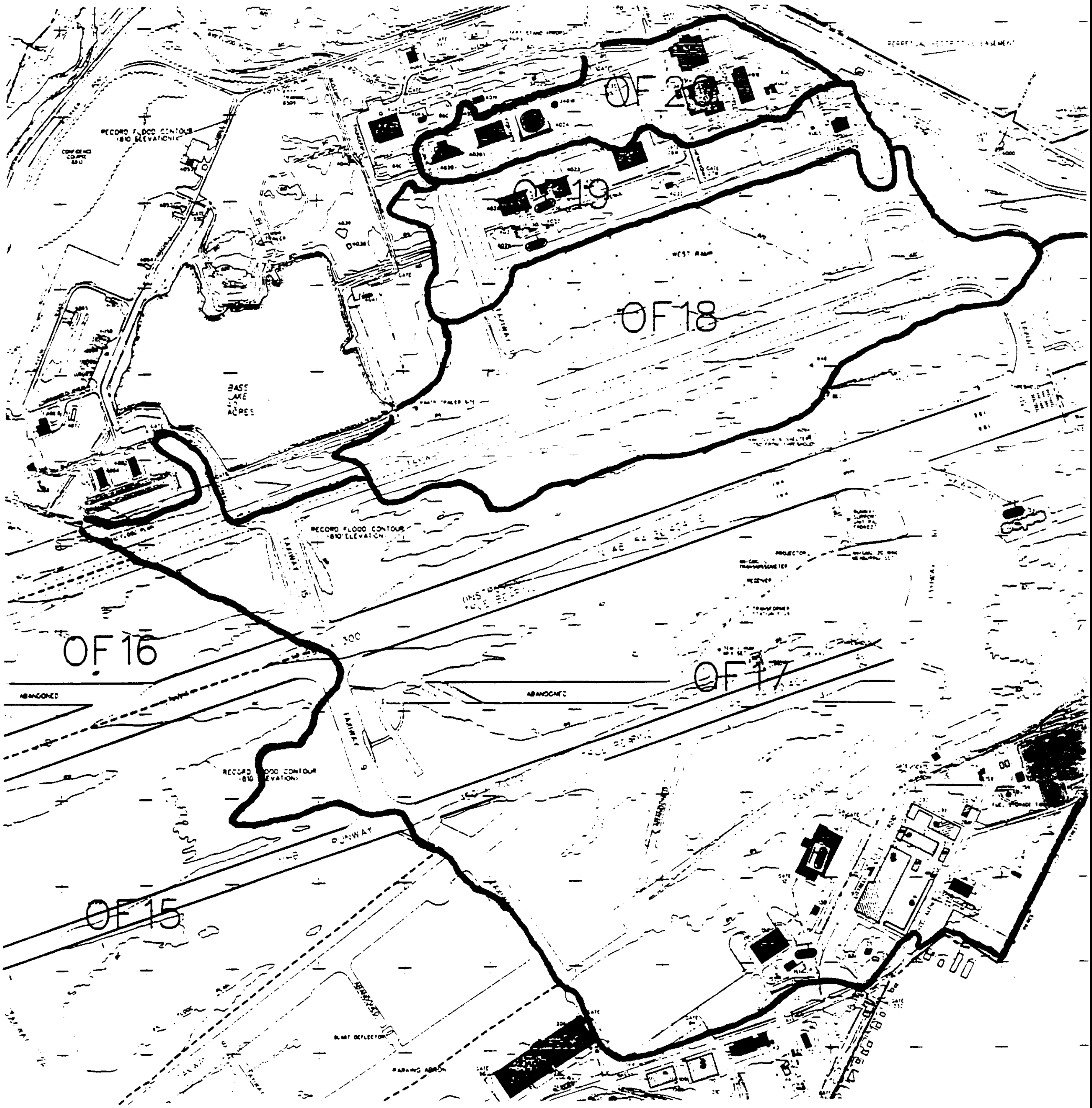
OTHER SIGNIFICANT ACTIVITIES - OUTFA

1 8 2



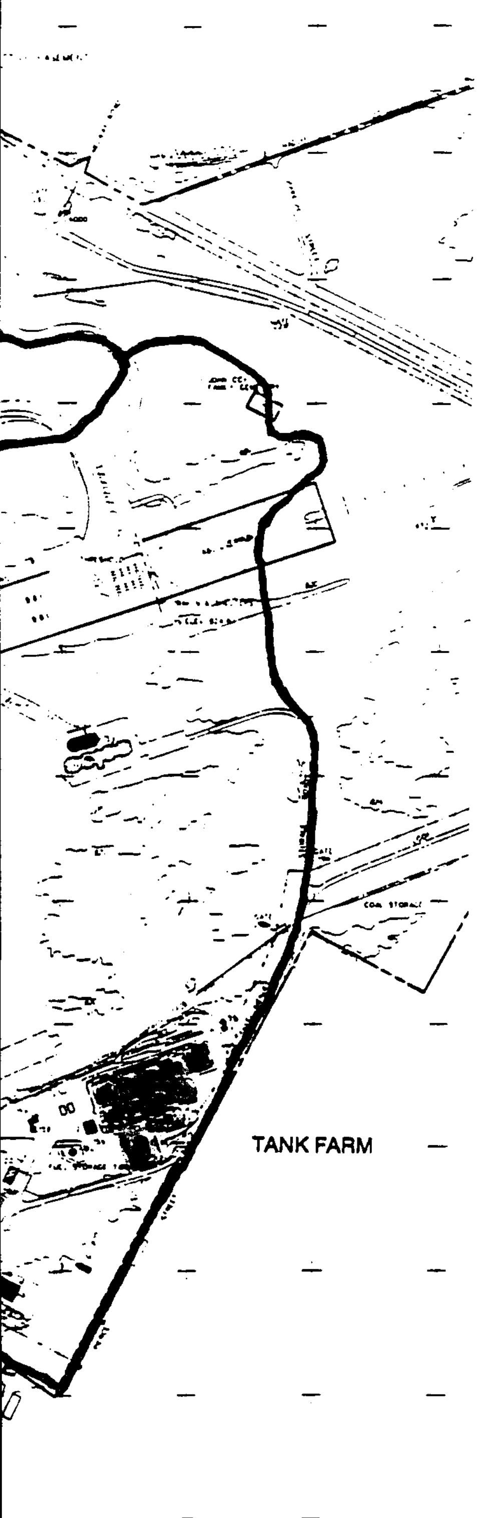
- OUTFALLS 13, 14, 15, AND 16

2 of 2



LIQUID STORAGE TANKS - OUTFAL

1192

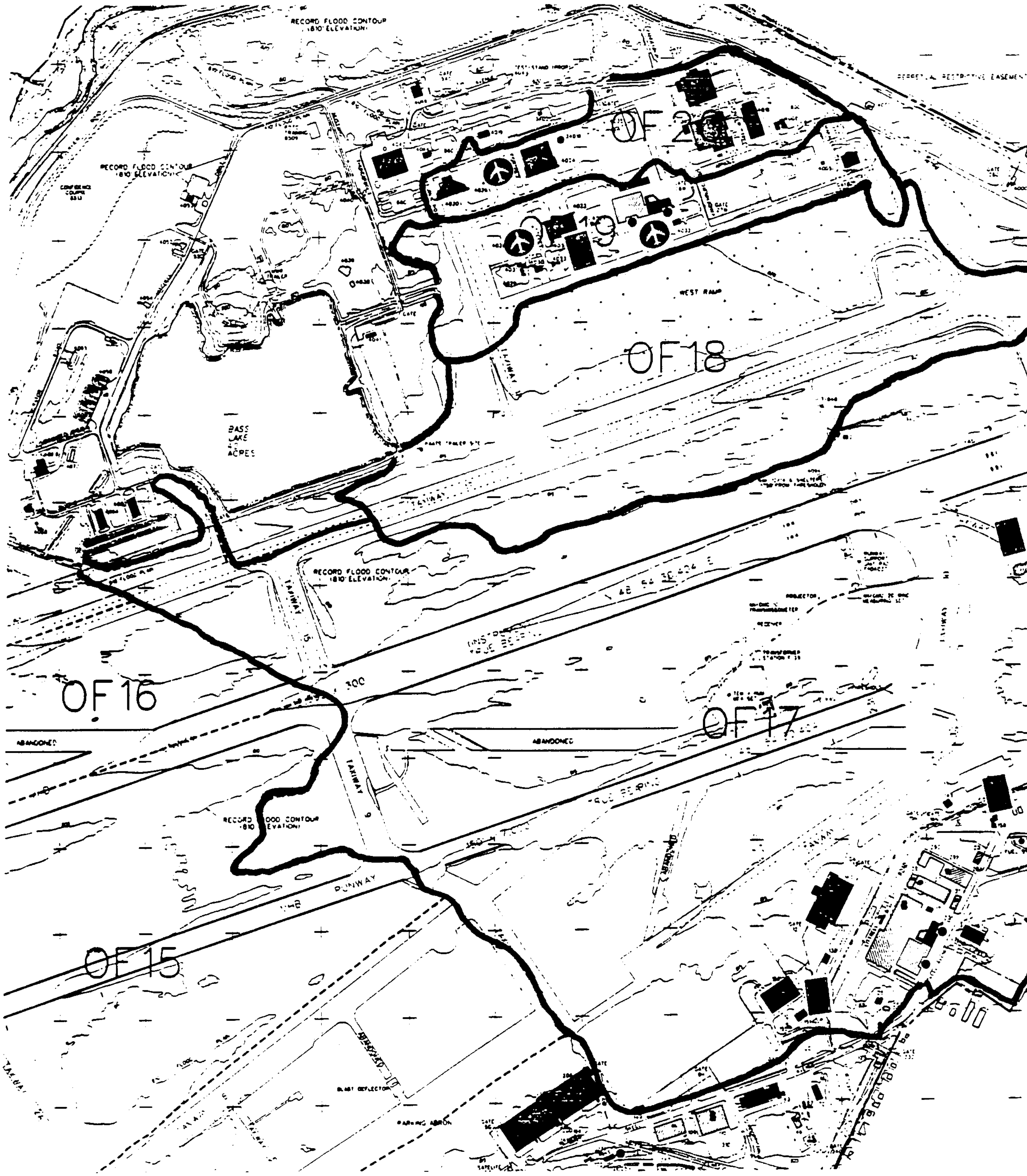


UNDERGROUND STORAGE TANK(S)
(CAPACITY GREATER THAN 5,000 GALLONS)

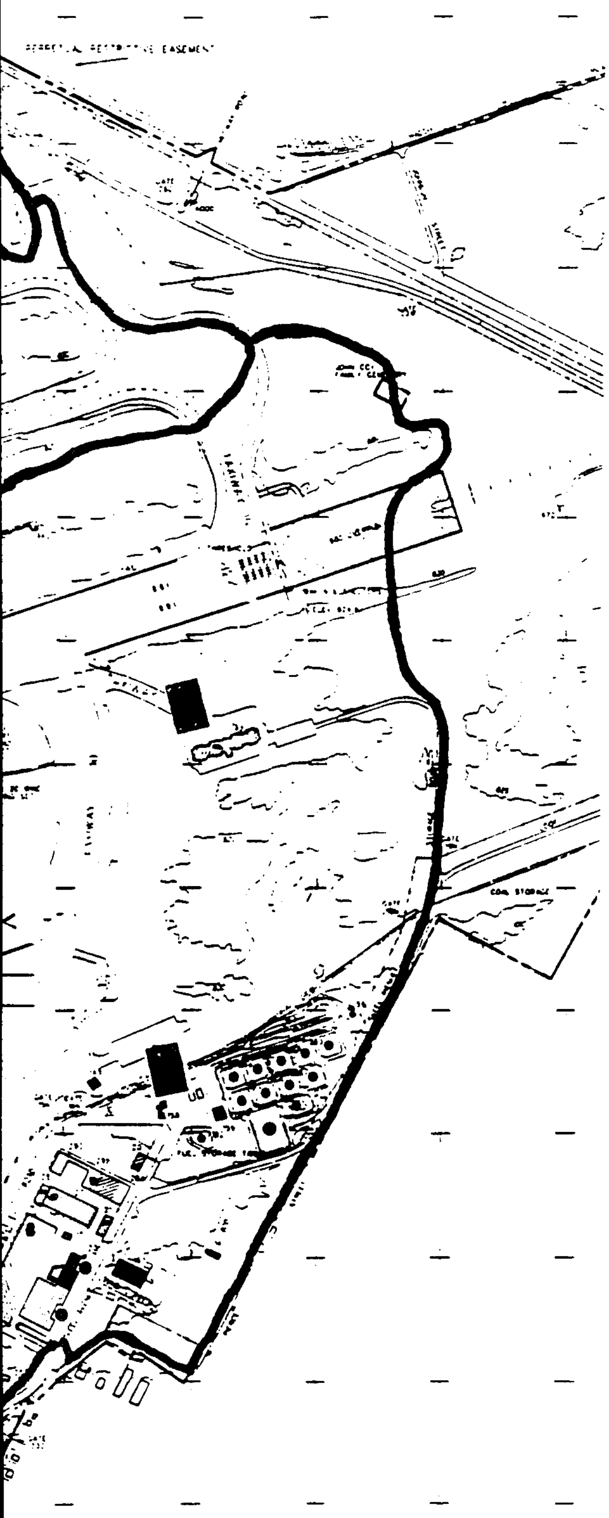
ABOVE GROUND STORAGE TANK(S)
(CAPACITY GREATER THAN 650 GALLONS)

KS - OUTFALLS 17, 18, 19, AND 20

2092



OTHER SIGNIFICANT ACTIVITIES - OUTFALL



FUEL STATIONS

GROUND VEHICLE AND EQUIPMENT MAINTENANCE (INCLUDES CLEANING AREAS)

WATER TREATMENT AND STORAGE

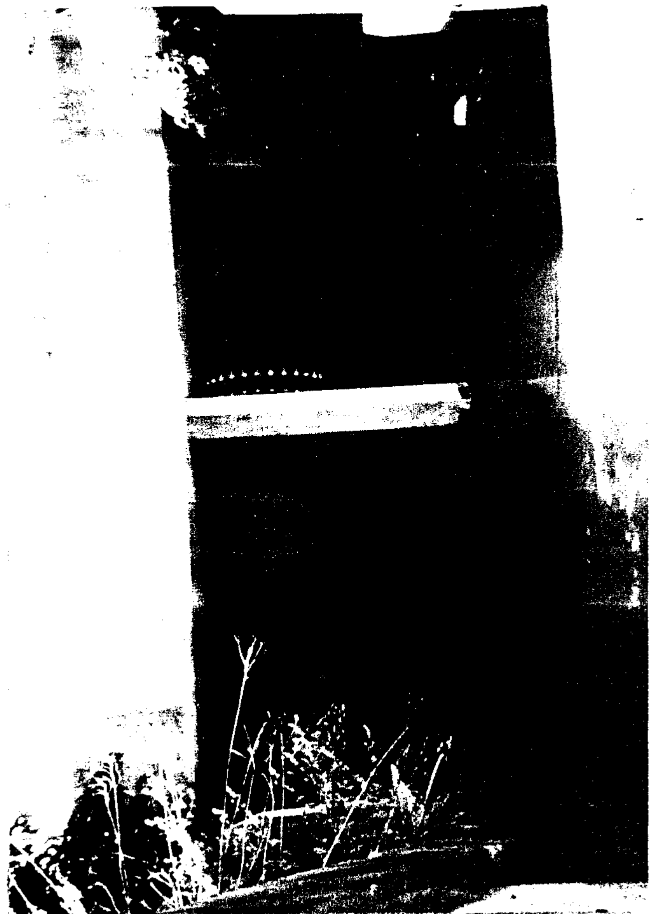
MATERIAL STORAGE AREAS EXPOSED TO PRECIPITATION

AIRCRAFT STORAGE AND MAINTENANCE AREAS

ES - OUTFALLS 17, 18, 19, AND 20

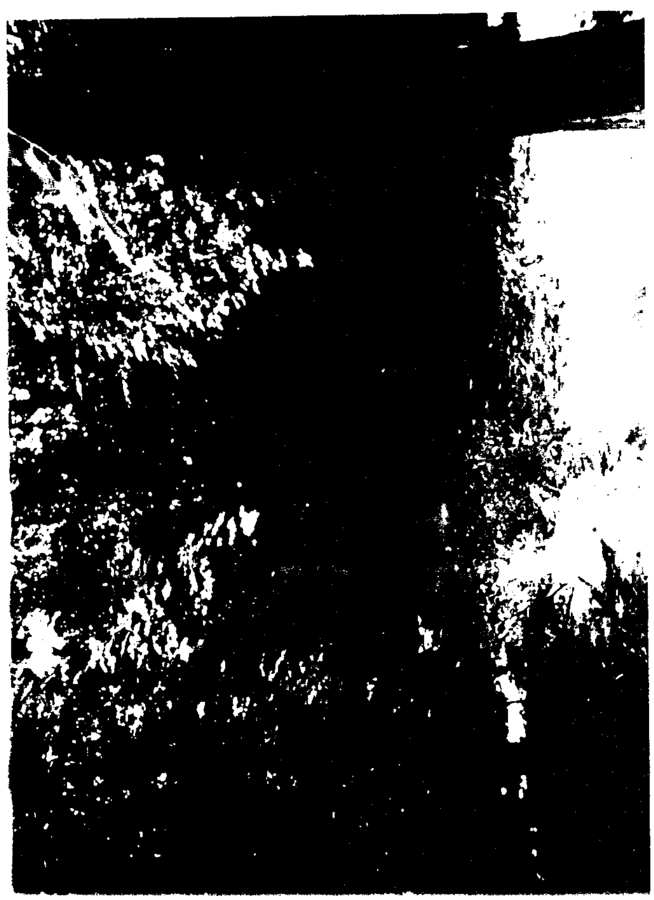
APPENDIX C

PHOTOS OF STORM WATER OUTFALL AREA DISCHARGE POINTS

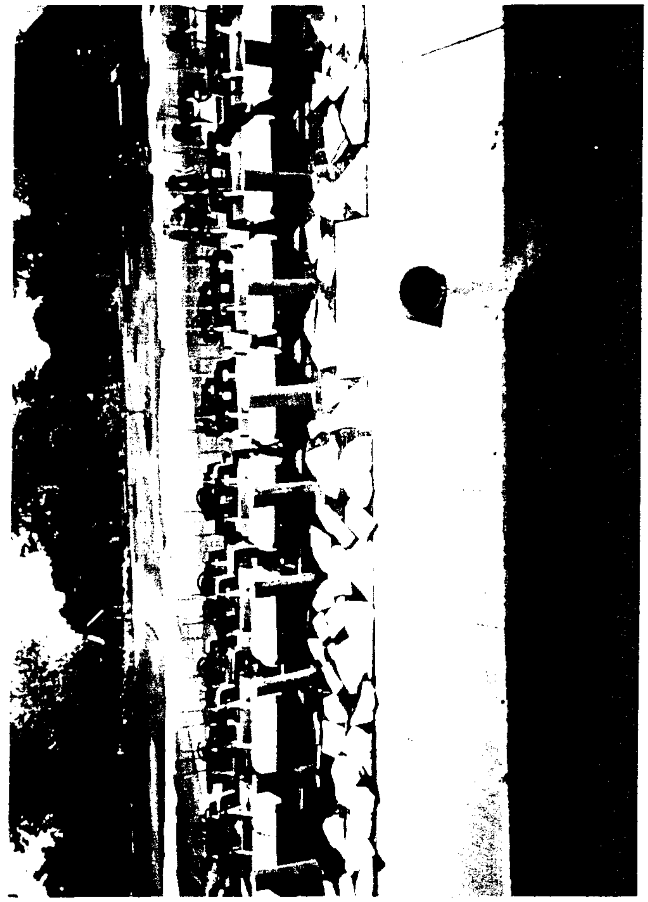


OUTFALL #1 ↓ OUTFALL #2 ↑

OUTFALL #3 ↓ OUTFALL #4 ↑

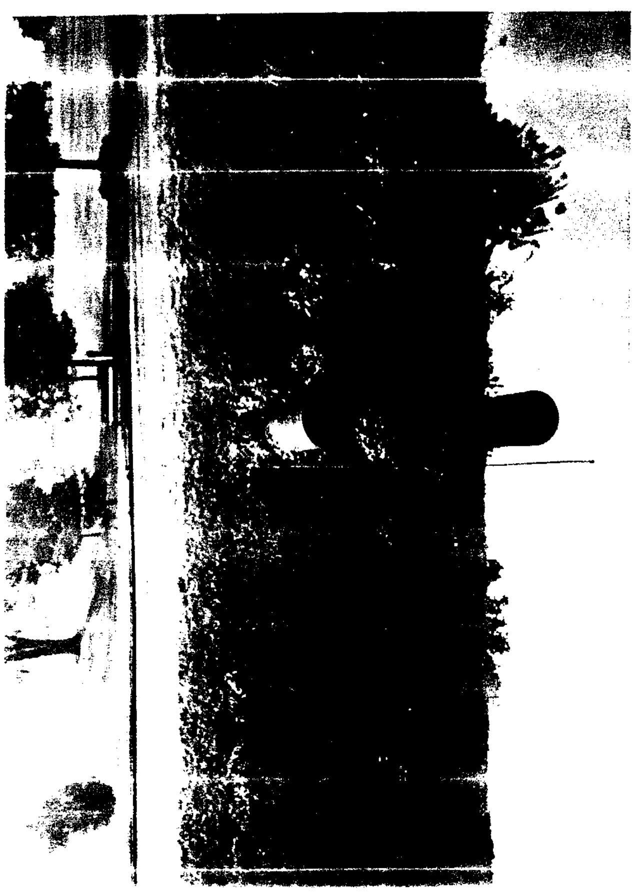


SIDESTREAM #5 ↑ OUTFALL #5 ↓ OUTFALL #6 ↓ OUTFALL #7 ↑



OUTFALL #8 ↓ OUTFALL #9 ↑

OUTFALL #10 ↓ OUTFALL #11 ↑



OUTFALL #12 ↓ OUTFALL #13 ↑

OUTFALL #14 ↓ OUTFALL #15 ↑

OUTFALL #16 ↓ OUTFALL #17 ↑

OUTFALL #18 ↓ OUTFALL #19 ↑

OUTFALL #20 ↓ HEBBLE CREEK ↑

TROUT CREEK

APPENDIX D

IRP SITE DESCRIPTIONS

IRP SITE DESCRIPTIONS

Operable Unit 6 (Outfall Area 1)

Landfill 1 (LF 1)

Landfill 1 was operated from the 1920s through 1940 and involved surface disposal and burning. General Base refuse containing unknown quantities of oily wastes, and organic and inorganic chemicals, were reportedly disposed of at this site.

Earthfill Disposal Zone 1 (LF 14)

This is one of eight disposal sites used by the Base in the 1940s for disposal of earthfill. There is no indication that hazardous materials were disposed of at the site. However, the materials similar to those disposed of at other landfills on the Base may have been transported to this site including unknown quantities of oily wastes, solvents, organic and inorganic chemicals, and hospital wastes.

Operable Unit 9 (Outfall Area 1)

Earthfill Disposal Zones 4, 5, 7

There is no indication that hazardous materials were disposed of at these sites. However, the materials similar to those disposed of at other landfills on the Base may have been transported to these sites, including unknown quantities of oily wastes, solvents, organic and inorganic chemicals, and hospital wastes.

Operable Unit 8 (Outfall Area 3)

Spill Site 5 UST at Fuels Management Laboratory Building

Spent fuels and solvents had been flushed down a sink in Building 70 to an oil and water separator. It was subsequently discovered in 1988 that this tank was inadvertently removed when several other USTs were removed from the area in March 1985. When the area was excavated to verify this, contaminated soil and fuel odor was detected to 12 feet below ground level. The pipe leading to the tank was found to be uncapped, but surrounding soil was not discolored. Further investigation showed that while the tank was being removed, 20 to 50 gallons of liquid had spilled and the contaminated soil had not been removed. Apparently, waste from the oil and water separator had been diverted to the sanitary sewer rather than to the soil.

Spill Site 7 Tank Farm F

This site is an inactive fuel storage area consisting of six USTs. All six tanks were removed and the site remediated under a Fiscal Year 1991/1992 MilCon project. Seven new fiberglass tanks were installed at this site. Site investigation and corrective action were performed under the UST program. Five million dollars of MilCon funds were dedicated to the removal and replacement of the tanks and an additional $1 million in environmental compliance funds were dedicated to contaminated soil removal. Tank removal and site disposition reports for Tank Farms B and F are currently being reviewed for finalization by the State fire marshall (SFM) for closure of these sites.

Spill Site 9 Tank Farm B

In April 1989, while installing four new USTs, fuel odors were detected. Four abandoned underground fuel lines were discovered. The lines had been capped in the 1970s. This finding resulted in a NOV from the SFM. During a September 1989 SFM/USEPA site visit, mineral spirit odors were detected in a drainage sump in Building 253. SS 34 was expanded from the four lines to include the entire Tank Farm B.

Spill Site 11 Fuel Tank Testing Range

This site operated from 1967 to the late 1980s as a survivability/vulnerability range to test aircraft fuel tanks. Low quantities of fuel were released until after 1981, when a containment system allowed as much as 500 gallons to be tested. This system was still vulnerable to heavy rains.

UST 71A (ST 50) Aero Propulsion Laboratory

This tank, located near the Aero Propulsion Laboratory, was used to store jet fuel and gasoline. When removed, no signs of leakage were found. Two borings were taken from locations directly adjacent to the excavated tank area during site investigation. TPH was detected in all samples, attenuating with depth. Some lead was also detected; however, no other contaminants were found.

Operable Unit 9 (Outfall Area 3)

Earthfill Disposal Zones 2, 3, 8, 9 and 10

There is no indication that hazardous materials were disposed of at these sites. However, the materials similar to those disposed of at other landfills on the Base may have been transported to these sites, including unknown quantities of oily wastes, solvents, organic and inorganic chemicals, and hospital wastes.

Operable Unit 8 (Outfall Area 4)

Spill Site 6

Spill Site 6 was discovered in 1985 when an electrical transformer was found to be leaking PCB oil. About 100 to 200 gallons of PCB oil are thought to have spilled at the site.

Operable Unit 1 (Outfall Area 5)

Landfill 8 (LF 8)

Landfill 8 was operated from 1955 until the early 1970s and received wastes from Area B. The landfill site encompasses about 13 acres (about 53,000 m^2) and is about 50 to 60 feet (15 to 18 m) deep. Based on interview information, four distinct operations were located at this site:

- general refuse disposal
- toxic and hazardous chemical disposal
- acid neutralization
- fire training activities north of Building 821

Landfill 10 (LF 10)

Landfill 10 covers an area of about 10 acres (40,000 m^2). LF 10 was operated from 1965 until the early 1970s and received waste from all areas of the Base. Both general refuse and hazardous materials were disposed at the landfill.

Operable Unit 12 (Outfall Area 5)

Central Heating Plant 5 (OT 44)

One of two operating heating plants on the Base, Central Heating Plant 5 (HP 5 - Building 770) contains five coal-fired boilers. Operation began in 1956, was expanded in 1980, and is still in operation.

Runoff from the coal storage area and other aqueous waste effluent streams are blended and clarified in a three-stage process before being discharged into the storm drainage system. Coal pile leachate and runoff streams may contaminate groundwater and surface water. They are characterized by a low pH and contain metals including iron, chromium, manganese, and other parameters such as chlorides and sulfate in concentrations exceeding drinking water standards.

Earthfill Disposal Zone 6 (LF 19)

There is no indication that hazardous materials were disposed of at this site. However, materials similar to those disposed of at other landfills on the Base may have been transported to this site, including unknown quantities of oily wastes, solvents, organic and inorganic chemicals, and hospital wastes.

Operable Unit 4 (Outfall Area 7)

Landfills 3 and 4

The refuse disposed of at Landfills 3 and 4 reportedly consisted of unknown amounts of oil wastes, solvents, organic and inorganic chemicals, hospital wastes, pesticides, and PCBs.

Operable Unit 10 (Outfall Area 13)

Landfill 13 (LF 13)

Landfill 13 covers four to five acres (16,200 to 20,200 m^2) and was operated as an open dump site for about 20 years. The duration of the operation and the nature of the disposal are not clearly known. Airplane parts and engine parts were reportedly disposed of at this site per a recent discussion with former Base personnel. The landfill could have been a major fill area, and refuse and wastes appear to have been placed in direct contact with groundwater.

Central Heating Plant 3 (HP 3)

Activity at HP 3 began in either 1939 or 1940 and was shut down in 1980. Steam was generated from coal stored in a pile adjacent to HP 3. This coal pile was reportedly contained in an area having a concrete pad. Runoff also drained to the storm drainage system. This coal pile was removed after HP 3 was closed.

The plant currently collects condensate for use in HP 4. The low grade steam flashed from the condensate is used for building heat. Spent acid from the ion exchange process used for boiler feedwater treatment is neutralized with soda ash and eventually drained into a storm sewer.

Spill Site 4 (SS 29)

SS 29 was discovered in March 1988 during construction of a water supply line on the west side of Building 172. An UST was previously located at the site, and a spill or leak from this UST is presumed to be the source of the petroleum contamination. The UST was reportedly removed in 1983 and this was confirmed by excavations; however,

steel piping associated with the UST was still in place. The removed UST was used as an emergency gasoline supply tank for water pumping equipment contained in the building. No information exists on the size or construction specifications of the tank or system. The UST contained leaded gasoline, but no inventory or operational records exist.

In March 1988, evidence of petroleum contamination was found during the installation of a water supply line. Gasoline odors were detected and two soil samples were taken at this time and analyzed for volatile organic compounds (VOCs) and lead. The soil excavated for the water supply line was removed and uncontaminated material was placed in the excavation.

Tank Farm 49A

While installing cathodic protection in June 1988, leaks were discovered in UST 209 (saturated surface soil) and in the pipe to abandoned UST 215. During tracer monitoring of the tank farm in 1989, leaks were also detected in USTs 210 and 213. Vapor monitoring indicated leaks near the tank top, thus it was concluded that the tank leaked only when full. VOC contamination was well below MCL but lead levels were significant.

Operable Unit 3 (Outfall 16)

Earthfill Disposal Zone 12

During a review of CE maps in December 1988, LF 25 was identified as an old gravel pit. It is suspected that construction debris, associated with a Patterson Field runway project in the early 1940s, was disposed of at this site. The site is adjacent to an area where large quantities of organic muck were reported during the construction of the runways at Patterson Field.

Operable Unit 2 (Outfall 17)

Spill Sites 2 and 3

This POL facility has been in operation at its present location since the mid 1940s. During that time, a number of leaks and spills were reported; the free phase TPH observed in several area monitoring wells would seem to verify the occurrences.

Spill Site 10

The flange from a newly installed fuel line burst upon startup and spilled about 150 gallons of jet fuel.

Long Term Coal Storage Pile

This area covers about three acres (12,000 m^2) and was active for about 20 years; three other coal storage areas preceded this site. OT 54 was used until early 1989 when the coal inventory was depleted.

Temporary Coal Storage Area

OT 55 was identified in April 1989 during a review of Base aerial photographs. It was determined that coal was stored at this site from 1949 to the late 1950s.

Coal Storage Area

OT 56, which is about five acres, was a coal storage area located adjacent to Building 89. The site was identified in April 1989 through a review of Base aerial photographs. It was determined that coal was stored at this site from 1941 through the early 1970s.

Coal and Chemical Storage Area

OT 57 is a flat, grass-covered field. Reportedly stored at the site were 25 one-gallon containers of muriatic and sulfuric acids and two half-gallon containers of carbon tetrachloride.

Operable Unit 11 (Outfall 20)

UST 4020 Fuel System Maintenance Hangar

This 250-gallon UST collected fuel and hydraulic fluid from an oil and water separator until it was pumped out and removed in 1986. No records of soil removal were found, but unknown quantities of fuels leaked during operation.

Operable Unit 6 (Outfall Region I)

Landfill 2 (LF 2)

From 1941 to 1955, the landfill was operated as a surface dump for general refuse from Area B. Refuse was placed into the gravel pit in direct contact with groundwater. From 1955 to 1975, the landfill was used as a hardfill disposal area. General Base refuse containing unknown quantities of oily wastes, solvents, organic and inorganic chemicals, and hospital wastes were reportedly disposed of at this site.

Operable Unit 9 (Outfall Region III)

Burial Site 3 (DP 47)

DP 47 was identified from a monthly Research and Development (R&D) report during the IRP Phase II Stage 2 investigation. The size and exact location of the site are unknown. However, through communications with Base personnel and in reviewing air photos, the location of DP 47 has been determined with reasonable certainty, and it is suspected that DP 47 may have been used to dispose of fuel sludge.

Operable Unit 4 (Outfall Region IV)

Landfills 6 and 7

The refuse disposed of at Landfills 6 and 7 reportedly consisted of unknown amounts of oil wastes, solvents, organic and inorganic chemicals, hospital wastes, pesticides, and PCBs.

Operable Unit 5 (Outfall Region IV)

Fire Training Area 1

This site was operated from 1950 to 1955. Contaminated fuels were burned in a dirt pit with a surrounding earthen dike after first saturating the ground with water to reduce infiltration.

Operable Unit 5 (Outfall Region V)

Landfill 5 (LF 5)

Various operations have taken place at this landfill. It was initially operated during the 1940s as a lumber reclamation area where scrap lumber was accumulated and sold to the public. It was then a surface dump operation accepting general residential refuse. The landfill was also the site of a waste petroleum handling operation where two halves of a 10,000 gallon (37,854 L) tank were used to burn flammable petroleum waste products. In addition, there was a 15,000 gallon (56,780 L) UST used to collect waste oil for 15 to 20 years. This UST was serviced by an off-Base waste oil reclaimer. In 1978, the UST was sold and the waste oil reclamation operation was discontinued at this site. Disposal of fly ash from the Base's heating plants, vegetation wastes from landscaping activities, and debris from construction occurred before landfill operations ended in May 1991 when the Base contracted for off-site disposal of fly ash.

Burial Site 4

At one time, a temporary chemical warfare structure that was believed to have been used for tear gas training was located near the site. Indications of past backfilling activities, including 10 to 15 drums scattered throughout the site area, were visible. The drums had no discernible marks or labels that indicated their contents. Three were corroded and contained only remnants of the original contents. They were removed as part of the drum removal project in 1990. No information exists that would verify a chemical warfare structure was associated with this site.

Gravel Lake Tank Site (ST 53)

ST 53 was identified on a Base map dated July 1945 and reportedly contained a torque sludge burning vat and four tanks. The map did not indicate the size of the tanks or whether they were above or below ground. The composition of the torque sludge is unknown. An April 1989 site visit indicated that past backfilling and earthwork had been performed, but no evidence of the tanks was found.

Operable Unit 2 (Outfall Region VI)

Burial Site 1

The area designated as Burial Site 1 encompasses the approximate locations of two areas in the northeast portion of Area C used from 1966 to 1971 to dispose of fuel tank sludges containing tetraethyl lead. The buried sludges contained tetraethyl lead, other lead compounds, and oily waste.

Operable Unit 7 (Outfall Region VI)

Landfill 9 (LF 9)

Landfill 9, also called Sandhill, was operated for a two-year period from 1962 to 1964. It was constructed in a sand pit and covers about nine acres. LF 9 was the first to receive wastes, including hazardous chemicals, from all areas of the Base. General Base refuse containing unknown quantities of oily wastes, solvents, organic and inorganic chemicals, and hospital wastes were reportedly disposed of at this site.

Operable Unit 11 (Outfall Region VII)

Burial Site 2

Burial Site 2 was in operation during the period from 1971 to 1975. Sludge containing tetraethyl lead from bulk fuel storage tanks was deposited here. The

systematic cleaning of the tanks generated about 700 gallons (2,650 L) of sludge per year. It is not known if those waste products were placed in containers before disposal.

Chemical Disposal Area

The Chemical Disposal Area is part of the Base's surface water drainage system. During the 11-year period between 1963 and 1974, personnel from the nearby industrial and maintenance shops disposed of various shop wastes in the SD 58 area drainage system. The wastes were reported to be ammonia cleaning solutions, paint remover, and aircraft washing chemicals. During the period of operation, waste disposal practices allegedly involved discharge into the creek that ran through a nearby ditch. This practice ceased in 1973; however, the ditch continues to carry surface runoff to the creek.

Operable Unit 3 (Outfall Region VIII)

Landfill 11 (LF 11)

Landfill 11 was used for general refuse disposal from 1968 to 1977. Uncovered large refuse including concrete pieces, cut metal storage tanks and several empty drums have been reported along the base of the side slopes.

Landfill 12 (LF 12)

Landfill 12 is a cyclone-fenced disposal area that was operated from 1968 to 1973. Initially, LF 12 was used for chemical disposal, acid neutralization, and hazardous material storage. Trenches about two feet (0.6 m) wide by three feet (0.9 m) deep were used for disposal. Acids were neutralized using the same procedures used at LFs 8 and 10 and neutralized wastes were allowed to percolate into the soil. During the late 1970s, LF 12 was used as a storage place for waste chemicals, including materials contaminated with the "herbicide orange." These materials were reportedly not opened within the storage area and were later removed and disposed of off-site.

Landfill 14 (LF 62)

A site visit revealed the presence of two large pieces of rusted, partially buried metal. The period of use of this site is unknown and as a result there is a potential for disposal of hazardous substances similar to those disposed at other landfills on-Base.

Spill Site 1 and Fire Training Areas 3 and 4

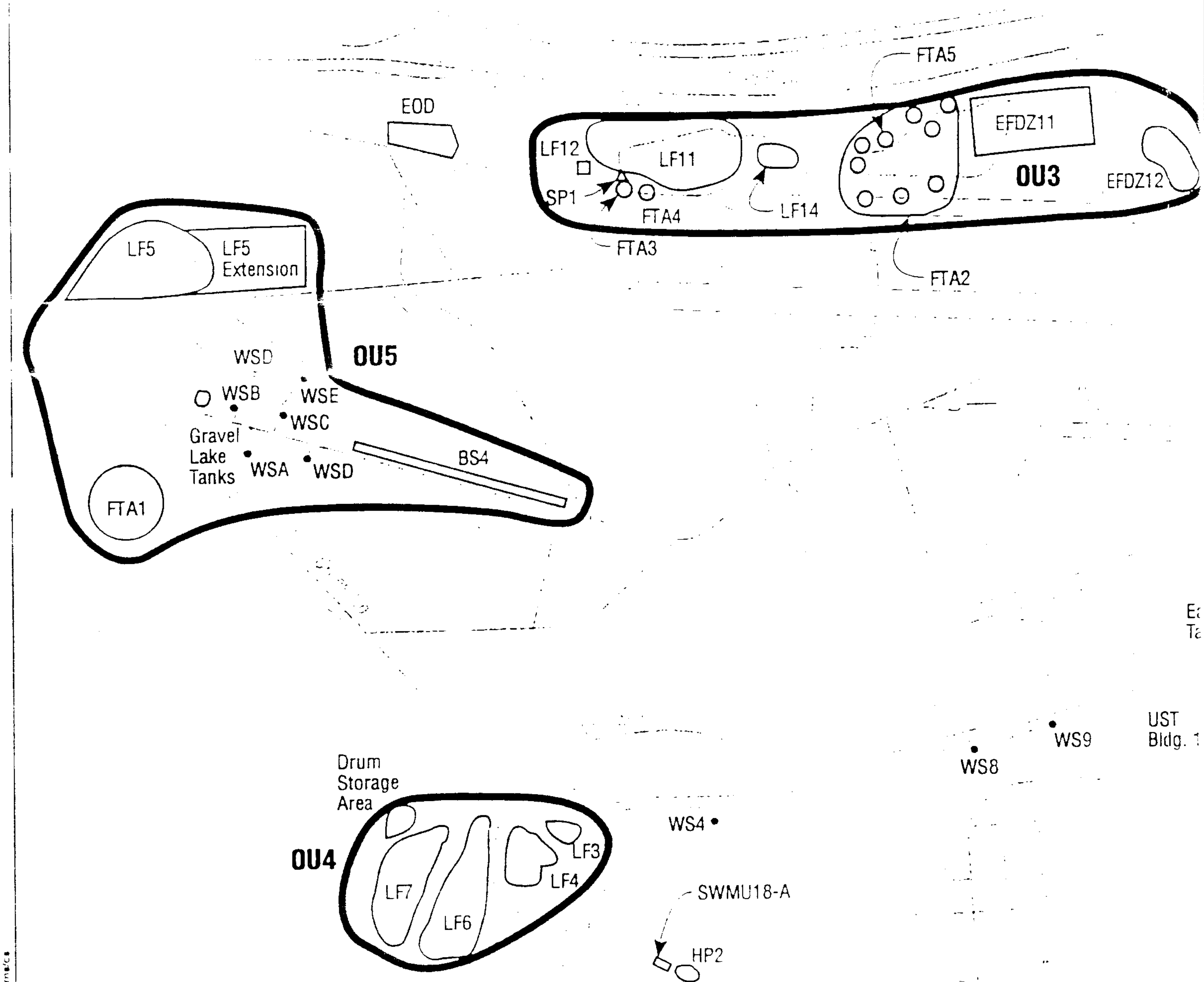
Fire training exercises were conducted at FT 37 and 38 between 1960 and 1980. Contaminated fuel was stored in a tank north of the site. The fuel was directly applied to the area and ignited. A 1,000 to 2,000 gallon fuel spill (SS 26) occurred north of FT 37 in 1972. The fuel was reportedly intercepted before it reached the Mad River.

Fire Training Areas 2 and 5

Fire Training Area 2 was operated from 1955 to 1969 and FT 39 was put in service in 1981. Operations at FT 39 were suspended in the Fall of 1986. During active use of FT 36, fuels were ignited and extinguished as a part of fire training exercises. The fuels used for this purpose may have been contaminated with water, oily wastes, hydrocarbon solvents, halogenated solvents, and leaded gasoline. Only clean fuels were reportedly used for FT 39. On 30 December 1986, about 2,700 gallons (10,220 L) of jet fuel were released from a tank used at FT 39 to store jet fuel for training exercises.

Earthfill Disposal Zone 11

LF 24 was identified during a review of CE maps in December 1988. Construction debris, associated with a Patterson Field runway project in the early 1940s, is expected to be present. An area adjacent to the site contains what has been described as "organic muck" on old Base maps. A 25,000 gallon above ground tank may have been situated in this area at one time.


EOD
FTA5
EFDZ11
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OU3
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WSD
OU5
WSB
WSE
WSC
Gravel Lake Tanks
WSA
WSD
BS4
FTA1
UST Bldg.
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OU4
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LF7
LF6
SWMU18-A
HP2

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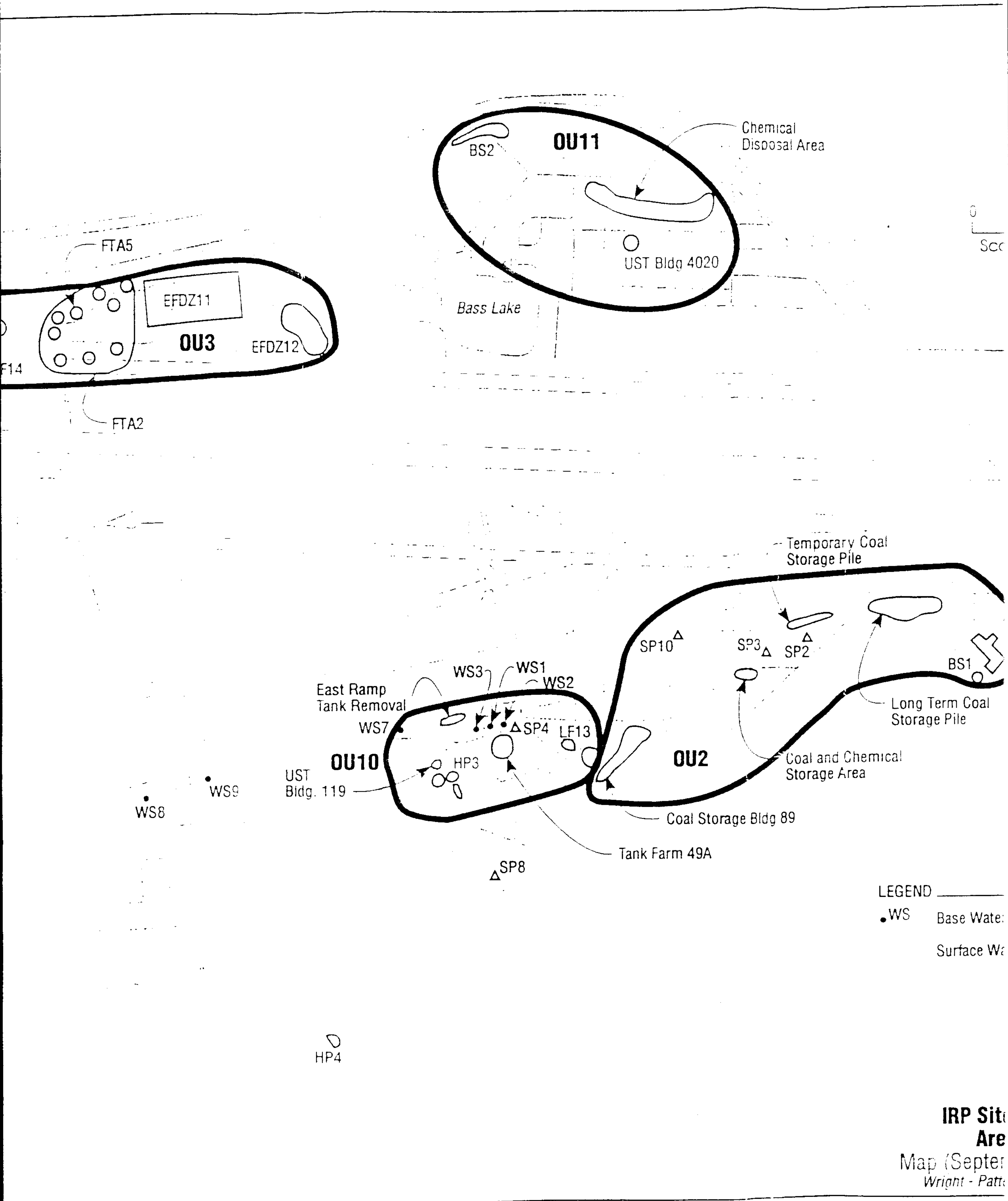
Chemical
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Temporary Coal
Storage Pile
SP10
SP3
SP2
BS1
Long Term Coal
Storage Pile
WS3
WS1
WS2
East Ramp
Tank Removal
WS7
SP4
LF13
OU10
HP3
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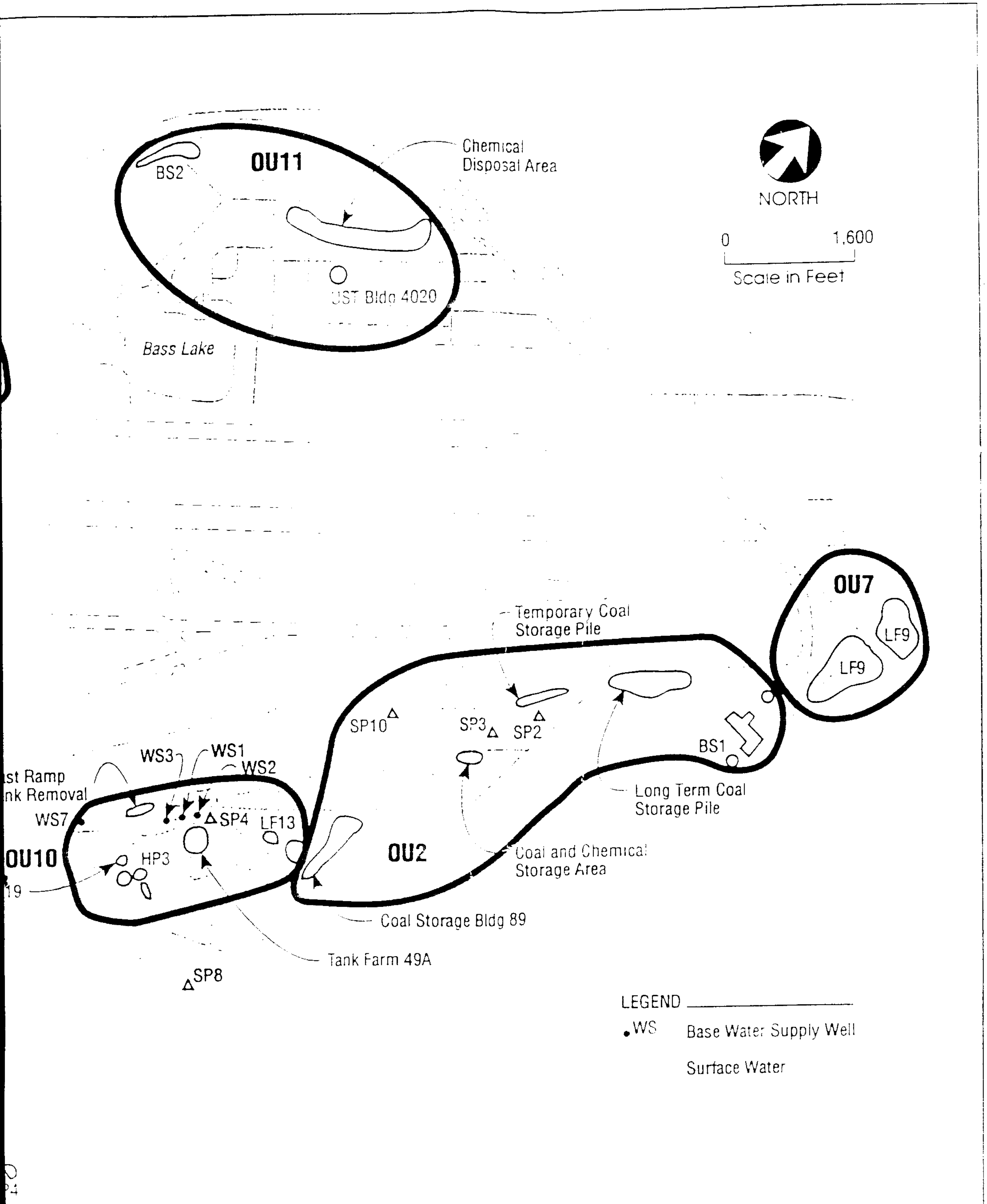
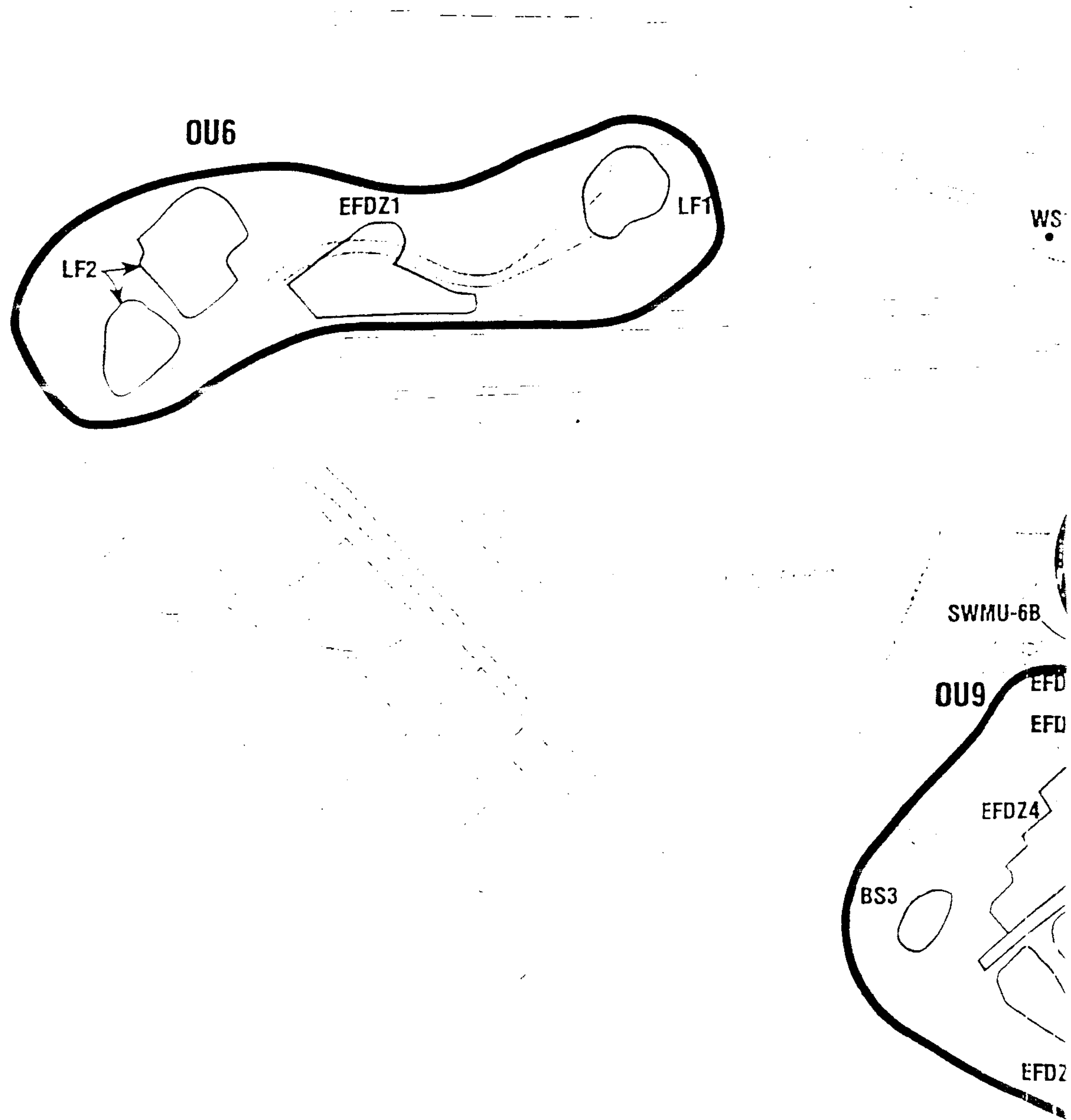


FIGURE 1
IRP Sites and OUs
Areas A and C
Map (September 1993)
Wright - Patterson AFB, Ohio

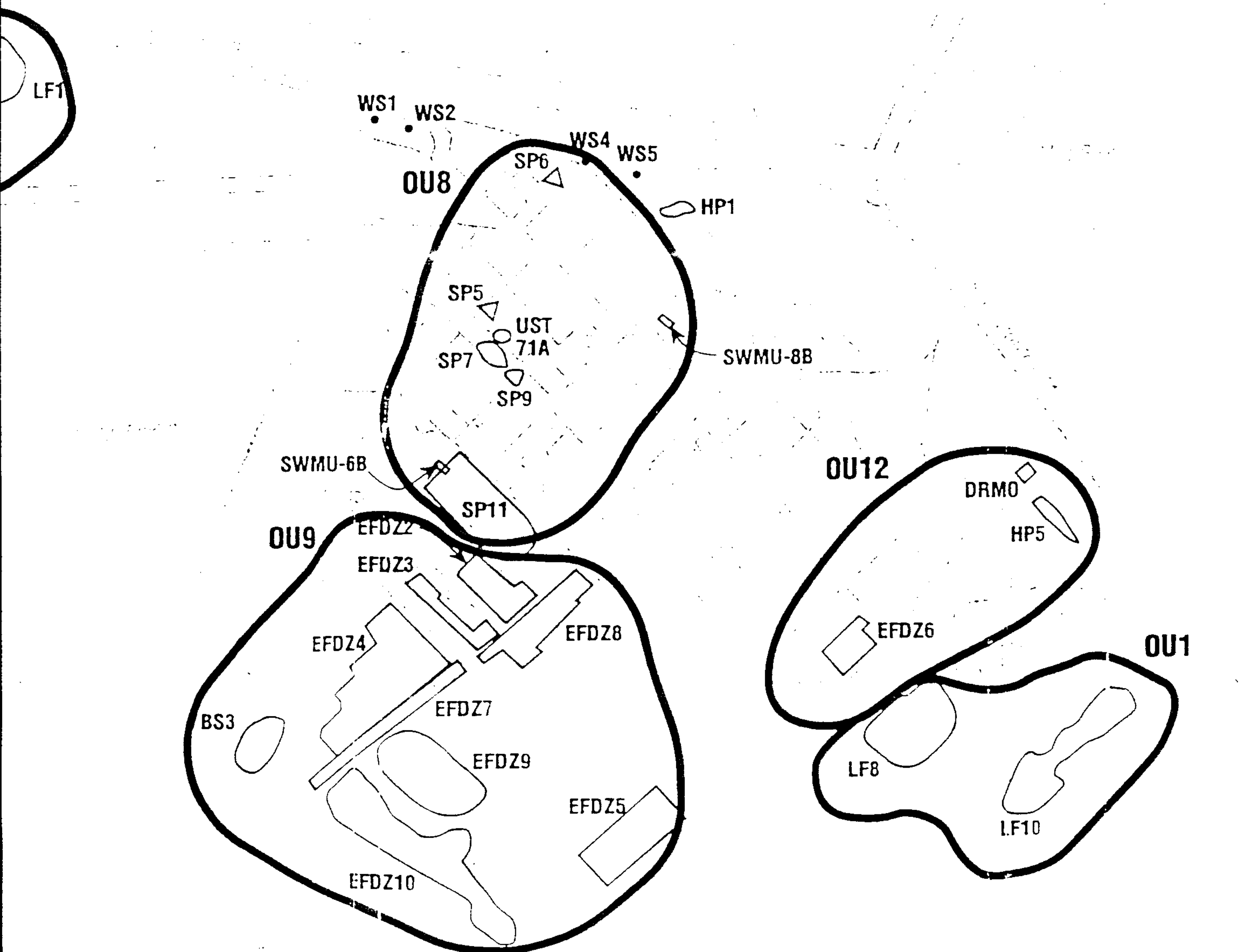
3 of 3



LEGEND

•WS Base Water Supply Well

Surface Water



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Scale

IRP Sites

MAP (Septemt

2 of 3

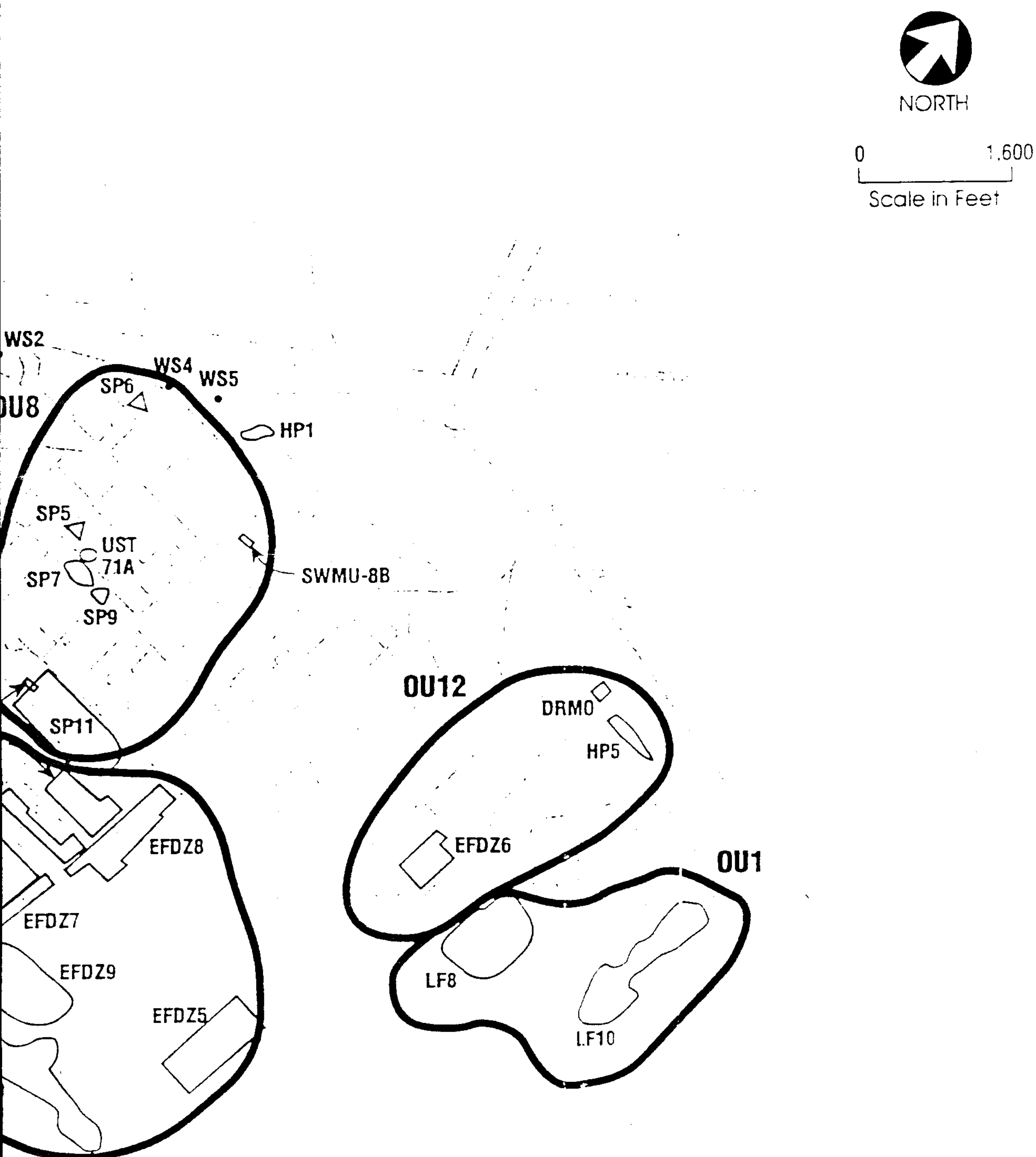

FIGURE 2
IRP Sites and OUs, Area B
MAP (September 1993)
Wright - Patterson AFB, Ohio

CH2M HILL

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